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ABSTRACT

Developed as part of the Marine Corps Institute (MCI) correspondence training program, this course on food service fundamentals is designed to provide a general background in the basic aspects of the food service program in the Marine Corps; it is adaptable for nonmilitary instruction. Introductory materials include specific information for MCI students and a study guide (guidelines to complete the course). The 16-hour course consists of four chapters (five lessons). Each unit consists of a text and a lesson sheet that details the study assignment and sets forth the lesson objective. A written assignment is also provided. Topics covered in the lessons include introduction to the food service program, food microbiology, sanitation (health standards, personal hygiene, food sanitation, dishwashing methods), and food service equipment, utensils, and safety precautions. The lesson sheets and written assignments are found at the end of the package of materials. (YLB)

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FOOD SERVICE FUNDAMENTALS

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7 Jan 1982

1. PURPOSE

This publication has been prepared by the Marine Corps Institute for use with MCI course, Food Service Fundamentals.

2. APPLICABILITY

This manual is for instructional purposes only.

E. J. LLOYD
Lieutenant Colonel, U.S. Marine Corps
Deputy Director

SOURCE MATERIALS

MCO P10110.14K	Food Service and Subsistence Management Manual, 25 Jan 1980
MCO P10110.16C	Armed Forces Recipe Service, 1 May 1980
MCO P10110.35A	42 Day Armed Forces Menu, Sept 1973
NAVSO P2455	Department of the Navy Safety Precautions for Shore Activities, Jun 1967
NavMed P-5010-1	Manual of Naval Preventive Medicine, Apr 1975
----------------	Navy Supply Corps Newsletter, Mar 1968
SECNAVINST 4061.1B	Food Sanitation Training Program, 16 Apr 1973

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Chapter 1

INTRODUCTION TO THE FOOD SERVICE PROGRAM

1-1. INTRODUCTION

Food service has long been recognized as playing a vital role in the welfare of our personnel and for its contribution to high morale. Shortly after the Revolutionary War, congressional interest turned toward the daily rations fed to naval personnel, with the first Navy Ration Law being enacted by Congress on 27 March 1794. This first ration law provided for a fixed daily allowance of food items for each day of the week with a typical day's ration being: 1 pound of hard bread, 1 1/2 pounds of salt beef, 1/2 pint of rice, and 1/2 pint of distilled spirits or 1 quart of beer. This law proved to be inflexible and was extremely limited in the source of protein foods and in the complete absence of green and yellow vegetables. By 1842, Congress discarded this method of legislating a fixed allowance for each day of the week, and provided a more flexible allowance of items on a quantitive basis, allowing substitution.

In 1862, the spirits ration was discontinued and a compensating 5 cents a day pay raise was granted. Other modifications had been made to this initial ration law that provided for fresh meat, dried vegetables, fruit, coffee, tea, and sugar. These revisions proved not to be the remedy for rather poor feeding. In 1933 Congress recognized the need for more vegetables and milk and for less meats and passed what is basically today's Navy Ration Law.

Food service has greatly improved since 1794, but this still is not enough. With today's rising food costs and the trend toward economic spending coupled with the realization of the impact that food service has on the morale and reenlistment rates in the Marine Corps, even greater progress is necessary in the future.

When a man enlists in the Marine Corps, his living quarters, work area, and dining area become his home 24 hours a day. You, a Marine food service man, are most likely the first contact he has each morning; therefore, you actually start the Marine's day. Your motivation, attitude, cleanliness, and method of preparing, cooking, and serving this Marine will have a great effect on his attitude and how well he performs his duties. A well-fed Marine is better able to do his job than one who has been poorly fed or poorly served.

Before you begin a study of cooking you must learn more about the organization of the dining facility, its purpose, the personnel who work in the dining facility, and some of their responsibilities and duties.

1-2. MISSION AND COMMAND RESPONSIBILITIES

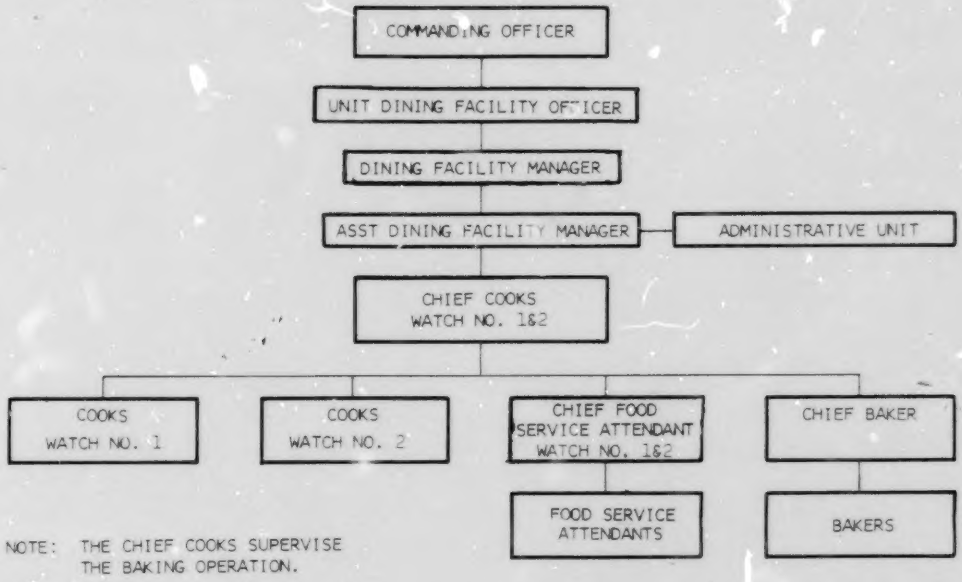
The mission of food service is to requisition, store, prepare, serve, and account for food in the most efficient manner possible under the prevailing conditions. Food service also includes related research and development, nutrition, acquisition of food, supplies, and equipment, menu and recipe planning, meal preparation and serving, sanitation, design and layout of facilities, personnel, training, and accounting and reporting.

The basic and most important unit in food service is the enlisted dining facility. The operational control of the enlisted dining facilities within the food service system should be delegated to subordinate unit commanders operating dining facilities within the system; however, the financial responsibility for the entire food service program is vested in the activity commander who operates the consolidated food service system. This financial responsibility cannot be delegated to subordinate unit commanders. The installation commander is also responsible for publishing an SOP (standing operating procedure) for the food service program to supplement instructions contained in Marine Corps directives.

1-3. CHAIN OF COMMAND OF THE DINING FACILITY

The feeding of our Marines is becoming more and more complex. Areas of responsibility may overlap. It is for this reason that we must have the chain of command or responsibility organized in such a way as to maintain peak operational efficiency.

The food service occupational field is authorized billets ranging from Pvt through LtCol. The intention of this paragraph is to explain the organization of the enlisted dining facilities. In doing so, the organization of a typical battalion dining facility has been utilized as the basic reference point. The information provided applies in varying degrees to wings, posts, stations, individual dining facilities, and other non-FMF dining facilities. Figure 1-1 illustrates how a typical Marine Corps battalion dining facility is normally organized for operational efficiency.


COMMANDING OFFICER
UNIT DINING FACILITY OFFICER
DINING FACILITY MANAGER
ASST DINING FACILITY MANAGER
ADMINISTRATIVE UNIT
CHIEF COOKS WATCH NO. 1&2
COOKS WATCH NO. 1
COOKS WATCH NO. 2
CHIEF FOOD SERVICE ATTENDANT WATCH NO. 1&2
CHIEF BAKER
FOOD SERVICE ATTENDANTS
BAKERS

NOTE: THE CHIEF COOKS SUPERVISE THE BAKING OPERATION.

Fig 1-1. Typical organization of a dining facility.

There is no set rank for each billet shown. The dining facility manager may be a MGySgt, MSgt, or a GySgt; the chief cooks may be SSgt's or Sgt's depending on the unit's T/O (table of organization). In smaller organizations such as posts or stations, the dining facility manager may be a SSgt or Sgt, and the chief cooks may be Cpl's. Stated simply, the senior enlisted man is designated the dining facility manager, the next two senior men are designated chief cooks, and the senior baker is designated the chief baker. If the dining facility is large enough to warrant an assistant dining facility manager, his rank will be junior to the dining facility manager but senior to the chief cooks and chief baker. Normally, the chief food service attendants are junior to the chief cooks but senior to the cooks on watch. There are exceptions to these rules, but only when the assignment is judged to be in the best interest of the dining facility and the organization.

1-4. RESPONSIBILITIES AND DUTIES OF PERSONNEL

Each dining facility is operated in the manner best suited to the overall accomplishment of the mission of its organization. Therefore, it is impractical to list all of the specific responsibilities and duties performed by each man in a unit dining facility. The following is a brief description of primary duties.

a. Unit dining facility officer. The unit dining facility officer is assigned by the unit commander having operational control of the dining facility. The unit dining facility officer's duties may include the following:

(1) Maintain a financial status record of the dining facility.

(2) Insure that food is prepared and served in an efficient, tasty, and appetizing manner.

(3) Make frequent inspections of the dining facility.

(4) Submit requisitions, via the appropriate channels, for all provisions and supplies required by the dining facility.

(5) Supervise the activities of the unit authorized custodian (normally the dining facility manager) in the collecting and safekeeping of dining facility funds until they are turned over to the activity collection agent.

(6) Require that a good state of cleanliness be maintained in the dining facility.

(7) Require that dining facility personnel become thoroughly familiar with their responsibilities and duties.

(8) Be responsible for dining facility property issued to the dining facility, take periodic inventory of this property, request disposition of excess and unserviceable items, and request property as required.

(9) Be responsible for the preparation and accuracy of reports required of the dining facility.

(10) Maintain data on food service personnel in the unit, institute a training program, either through on-the-job training or correspondence study, for these personnel, and recommend additional training as appropriate.

b. **Dining facility manager.** The dining facility manager is the senior enlisted man in the dining facility. His responsibilities and duties include the following:

(1) Be responsible to the unit dining facility officer for the detailed operation of the dining facility.

(2) Supervise and coordinate the activities of the chief cooks and other dining facility personnel in the dining facility.

(3) Maintain the necessary records and reports required of the dining facility.

(4) Take inventory of food supplies and equipment.

(5) Plan menus under the supervision of the unit dining facility officer to insure that food is appetizing and nutritionally suitable.

(6) Estimate the daily needs of the dining facility and assist the unit dining facility officer in requistioning food supplies and equipment.

(7) Be responsible for keeping the dining facility building, equipment, and area in a clean state of police at all times.

(8) Frequently check appliances and equipment, report shortages or defects, and recommend necessary repairs.

(9) Supervise the actual preparation, cooking, and serving of food.

(10) Initiate a training program for the OF 33 personnel working in the dining facility.

(11) Take steps to insure the proper utilization of food and the elimination of waste.

(12) Prepare the Cooks' Worksheet, listing the food items to be served on the day's menu, recipes to be followed, and the number of portions to be prepared.

(13) Instruct the dining facility personnel and supervise the instruction given by other members of the dining facility.

(14) Train dining facility personnel for future positions of responsibility in the dining facility and make recommendations for promotion.

(15) Inspect dining facility personnel and the dining facility daily to insure a high state of sanitation.

(16) Perform the duties of the unit authorized custodian as directed.

(17) Maintain order in the dining facility.

c. Chief cooks. A unit dining facility may have one or several chief cooks depending on the unit's T/O. A chief cook should be experienced in the preparation, cooking, and serving of food. He directly supervises the cooks on watch, the bakers, and the chief food service attendant and should be familiar with the duties of all personnel in his charge. His responsibilities and duties include the following:

(1) Supervise and coordinate the activities of the cooks on watch in the preparation, cooking, and serving of food.

(2) Order from the storeroom the food items required to prepare the meals to be served.

(3) Supervise and instruct the cooks on watch in the proper methods of recipe conversion and the correct use of recipes.

(4) Supervise the cooks on watch in the use of the Cooks' Worksheet and Product Sheets.

(5) Assist the dining facility manager in the preparation of menus and requisitions.

(6) Inspect the galley area to insure that the equipment and utensils are kept sanitary and are properly assembled or stored.

(7) Observe the rules of personal hygiene and require the cooks on watch to do the same.

(8) Is especially careful to eliminate all methods of work which cause food waste.

(9) Supervise the chief baker and chief food service attendant in the performance of their duties.

(10) Supervise setting-up the serving line and serving of food.

(11) Insure that each man receives the proper portion size through the use of portion control.

(12) Be responsible for the proper completion and utilization of the Cooks' Worksheet.

d. Cooks on watch. The responsibilites and duties of the cooks on watch include the following:

(1) Prepare, cook, and serve food in quantities according to the Cooks' Worksheet, NAVMC 36 (Rev 8-69) and the Armed Forces Recipe Service, MCO P10110.16_, under the supervision of the chief cook.

(2) Read and convert standard recipes required to prepare and cook foods.

(3) Measure, weigh, and mix ingredients according to the recipes using a variety of food service equipment and utensils such as blenders, mixers, grinders, slicers, tenderizers, and scales.

(4) Add seasoning to foods during mixing or cooking and observe and test foods being cooked by tasting, smelling, or piercing with a fork to determine if cooked.

(5) Cut, trim, or bone meats and poultry prior to cooking.

(6) Carve meats on the serving line.

(7) Add garnishes, sauces, or gravies to foods to enhance their eye appeal and flavor.

(8) Wash, peel, cut, and shred vegetables and fruits to prepare them for use.

(9) Observe rules of personal hygiene at all times.

(10) Clean the galley, equipment, and utensils and make sure they are properly stored.

(11) Learn all possible about the equipment, its capabilities, how to use it, and how to clean it.

(12) Be familiar with all the safety precautions to be observed when working in the dining facility.

(13) Assist in the instruction of new cooks in the routine procedures of the dining facility.

(14) May be assigned to perform other duties in the dining facility as required by the organization of the particular dining facility.

e. Bakers. The bakers assigned to the dining facility are responsible for preparing the bread and pastry items appearing on the menu that are not furnished by a centralized or commerical bake shop. The bakers are also responsible for the cleanliness of their work area. Under the supervision of the chief cooks, the chief baker will coordinate the work of the bakers.

f. Chief food service attendants. The chief food service attendants should be experienced cooks who know and understand the daily routine of the dining facility operation well enough to instruct and supervise the many different tasks the food service attendants must perform. They are responsible to the chief cook for the performance of their duties which include the following:

(1) Coordinate their activities with the chief cook.

(2) Check the Cook's Worksheet to determine if there is any change in routine or serving times.

(3) Supervise the activities of the food service attendants.

(4) Inspect the food service attendants prior to each meal to insure that they are maintaining high personal hygiene standards and are thoroughly indoctrinated in recommended food handling techniques.

(5) Inspect the dining facility frequently to insure that a high state of police is maintained.

(6) Instruct all new food service attendants in their duties.

(7) Insure that all food service attendants who operate equipment in the dining facility are properly instructed to the safety precautions to be observed when using the equipment.

g. Food service attendants. The food service attendants assigned to the enlisted dining facility are normally assigned for a period of 30 days. They may be assigned for longer periods; however, they should not be required to serve more than 90 days in one calendar year. Pvt's, PFC's, and L/Cpl's are normally detailed as food service attendants, but when the number of Pvt's, PFC's, and LCpl's is insufficient, NCO's may be assigned. Therefore, it is not uncommon for corporals and sergeants to be assigned to food service attendant duty because of a shortage of the junior personnel. Women Marines will not be assigned duty in dining facilities that serve only male personnel. All personnel assigned to food service attendant duty must pass a physical examination to determine if they are qualified to be food handlers. Some of the duties of food service attendants are:

(1) Assist in receiving and storing supplies received at the dining facility.

(2) Assist the cooks in the vegetable preparation room by cutting, peeling, trimming and slicing vegetables and fruits prior to cooking or serving.

(3) Serve foods under the supervision of the chief cooks and chief food service attendants.

(4) Perform other tasks as necessary to keep the dining facility in a high state of cleanliness, wash eating and food preparation equipment, and collect and dispose of waste material.

h. Administrative unit. The personnel assigned to the administrative unit of the dining facility may perform various duties as required to assist the dining facility manager in keeping the records and accounts of the unit dining facility. The storeroom and property man will usually be part of the administrative unit.

1-5. LOCAL MENU PLANNING BOARD

a. Establishment. A menu planning board will be established at each activity operating a dining facility(ies). The menu planning board will include the installation food service officer, the subsistence officer, food service operations officer (bakery), and a representative of the medical department. The representative of the medical department aids the menu planning board in planning nutritional and well balanced menus. Unit dining facility officers, dining facility managers and a nonfood-service enlisted representative of each organization operating an enlisted dining facility should attend the menu planning board meetings whenever possible.

b. Purpose. The purpose of the menu planning board is to plan nutritional local menus based on the 42 Day Armed Forces Menu, MCO P10110.35_, and the availability of subsistence items, climatic conditions, command requirements, cost limitations, and troop preferences. The local menu planning board also provides a source of liaison among food service personnel resulting in an exchange of ideas and mutual help in problem solving.

c. Topics discussed. Items that may be discussed at a local menu planning meeting:

(1) Availability. Most foods are available all year around either frozen, canned, or fresh. In-season fresh foods are more likely to be cheaper and should be utilized. A good example of this would be fresh vegetables and fruits used for salads or deserts.

(2) Troop preference. Consideration of troop preference is one of numerous problems which the menu planning board must deal with. The menu planning board not only selects the foods to be served but also specifies the method of preparation, how they are combined with other foods into meals, and how often they appear on the menu. The board's most useful guides in making these selections are the board members' knowledge of foods and past experiences with the men's reactions to the foods included in the menus. Particularly important are the likes and dislikes of the men. Common sense tells us that a person tends to eat what he likes and tends to reject what he dislikes. How well the menu planning board puts together the available information and the accuracy of their decisions about troop preferences are important factors in the adequacy of the ration and its effects on morale.

1-6. FOOD MANAGEMENT TEAMS

a. Authorization. Three food management teams are currently authorized for the Marine Corps. The teams are under the technical direction and operational control of Headquarters, Marine Corps. Two of the teams visit commands in CONUS. The third team visits commands in the Western Pacific area.

b. Personnel. Each food management team consists of a food service officer (3302), two food service technicians (3381), and a baker (3311). Additionally, the two CONUS teams have each been increased by one food service technician (3381) and one baker (3311). Their mission is to render assistance in raising the quality of food service, achieving economy, and increasing effectiveness at the various activities visited by:

(1) Reviewing activity food service program documents, i.e., plans for operation, financial plans, budgets, etc., to determine if food service requirements have been included.

(2) Instilling food service management discipline in all responsible personnel with special emphasis on quality of prepared foods, improved merchandising of food items, productivity and efficiency of food service personnel, food service safety requirements, fire prevention, and sanitation.

(3) Inducing and stimulating professional pride in food service personnel.

(4) Evaluating and encouraging application of standard and uniform policies and procedures.

(5) Providing on-the-job instruction to food service personnel through a team concept, utilizing the best qualified senior food service managers and executives and employing the most advanced training aids and training techniques.

(6) Reviewing the use of facilities, equipment, personnel, subsistence, and other food service resources to obtain valid evaluations of activity food service programs by identifying limitations that hamper accomplishment of activity objectives.

(7) Participating actively in an advisory capacity in the operation of the local food service program by working with local food service personnel, demonstrating proper techniques in all phases of food service (including management, production services of food, sanitation, training, and accounting), and motivating food service personnel toward increased efficiency and effectiveness.

(8) Assisting in the development of a patron education program to insure that personnel supported by a food activity understand elements of the food service program, especially food conservation.

(9) Evaluating the practical application of food service techniques learned through technical and on-the-job training, programs of instruction, curricula, and formal training.

(10) Providing information on, and demonstrating new developments in, the food service and subsistence fields.

(11) Exchanging, searching for, and collecting new ideas regarding food service for submission to the Commandant of the Marine Corps for possible adoption and dissemination to all Marine Corps activities that operate a dining facility.

(12) Recording observations that will provide the Commandant of the Marine Corps with followup actions that can be used to assist activities in resolving problems related to food service.

c. Arrival. When a food management team reports to a command, it is standard practice to conduct a briefing for the commanding officer having operational control of the dining facility to be visited. During this briefing the team discusses its function and purpose. Often the commanders will point out existing or potential problem areas within the dining facility operation and request assistance or guidance from the team.

d. Departure. Prior to departure from a command, a separate report is prepared on each dining facility visited and a briefing is conducted. At this time, all problem areas noted during the visit are discussed in detail and the team's report is presented to the commander. Reports are also submitted, via the local commander, to Headquarters, Marine Corps. These reports contain the approximate number of hours of instruction given on cooking, baking and food service management, the overall condition of buildings and equipment, recommendations for improvements of the enlisted dining facility, and the overall quality of food and service provided members of the command.

Chapter 2

FOOD-MICROBIOLOGY

2-1. INTRODUCTION

Food poisoning and the spread of food-borne illnesses would be a thing of the past if foods were procured from approved sources and were processed, prepared, and served with careful adherence to recommended sanitary practices. The majority of food-borne illnesses can be traced to one or more of the following: Food that has been prepared far in advance of serving, poor refrigeration, disregard of time and temperature factors, or food service personnel who were ignorant of or careless in applying recommended food-handling techniques. Even with exact care in handling, most uncooked foods will harbor micro-organisms.

Microbes are minute invisible plants which are found in soil, water, dust particles, air, and on vegetables. Great numbers of microbes live on the skin and in the mouth and intestines of healthy men and animals. The study of microbiology is concerned primarily with the practical effects of their presence in our daily lives. Food microbiology deals with the relationship of microbes to the beneficial and nonbeneficial changes occurring in food. Bacteria, molds, and yeasts are present in food and alter it according to their presence, growth, and distribution. Desirable changes in foods such as the making of cheese or butter from raw milk or the production of sauerkraut from raw cabbage are caused by microbes. Not all microbes are harmful. In fact, many are not capable of producing disease. These nondisease-producing microbes are known as nonpathogenic microbes. The microbes which are disease producing are known as pathogenic microbes. It is correct to call pathogenic microbes "germs." You, the cook, are concerned with food microbiology because the daily procedures performed in the preparation, cooking, and serving of food are associated with food microbiology.

2-2. TYPES OF MICROBES

Microbes may be divided into five general groups.

a. Protozoa are the simplest form of animal life. They are unicellular (1-celled) and microscopic in size. One species of protozoa is the cause of a severe dysentery known as amoebic dysentery. Other species are found as normal inhabitants of the human intestinal tract and do no harm.

b. Rickettsia are parasites found under natural conditions only in the cells of infected tissues and blood or feces of animals or humans. They are of little importance in food spoilage; however, they do cause typhus and Rocky Mountain spotted fever in man.

c. Viruses are among the smallest of micro-organisms and cannot be seen through an ordinary microscope. Viruses are easily transmitted by food and water; therefore proper sanitation cannot be overemphasized. Colds, measles, and polio are examples of diseases caused by viruses.

d. Fungi are a chlorophyll-free group of plants which include molds and yeast. They cannot derive nourishment from the sun; therefore, they must attach themselves to a source of food.

(1) Yeasts are unicellular fungi which are found in many places, such as on the surface of fruits, in the nectar of flowers, and in insects and various animals. Yeast are common in dairy products, especially cream, butter, and certain types of fermented milk. Yeast produces the CO_2 gas which causes the rising of bread and produces the alcohol for making beer.

(2) Molds are usually found growing on solid substances, such as wood, paper, cloth, meats, fruits, vegetables, and other materials. Molds do cause food spoilage, but they also are responsible for the appearance and flavor of cheeses. Penicillin is also the product of a mold.

e. Bacteria constitute the largest group of microbes. To humans, some types of bacteria are beneficial, some useless, and others harmful. Bacteria are 1/25,000 of an inch long. It would take 25,000 of them laid end to end to form a line 1 inch long.

(1) Shape. Three forms of bacteria which may be seen through a microscope are:

(a) Cocci. Spherical or round-shaped bacteria. Pneumonia, scarlet fever, and sore throat are caused by cocci bacteria.

(b) Bacilli. Cylindrical or rod-shaped bacteria. Botulism, typhoid fever, and tuberculosis are caused by bacilli bacteria.

(c) Spirilla. Spiral-shaped bacteria. Cholera and syphilis are caused by spirilla bacteria.

(2) Growth requirements.

(a) Food. Bacteria, like all living things, need food for growth. They cannot manufacture their own food and must live on other living things or substances. Many foodstuffs provide nourishment for bacteria growth. If the food is warm and moist, the bacteria grow rapidly, bringing about decay or useful fermentation.

(b) Moisture. Under normal conditions, bacteria cannot live without water. Bacteria which produce spores are able to withstand the absence of water more readily than those that cannot produce spores. As spores, bacteria can exist, but they cannot grow until moisture is found.

(c) Temperature. Most disease germs grow best at body temperature (98.6°F). Boiling temperatures kill bacteria but freezing does them no harm, though it does keep them from multiplying. Temperatures below 40°F retard bacteria growth and temperatures above 160°F will kill most bacteria.

(d) Oxygen. Most bacteria, such as staphylococci can live in the presence of air; however, some bacteria grow without air. One such type of bacteria produces a toxic substance which causes botulism, a deadly food poisoning.

(3) Reproduction. The process of reproduction in bacteria is asexual; there are no male or female cells and no fertilization is needed. When the original cell is as large as it can grow it splits to form two new cells. The two new cells grow until they are as large as they can grow and they each split to form additional cells. This form of reproduction normally takes place every 20 minutes; however, different species of bacteria multiply at different rates. Given optimum conditions, one bacteria could reproduce at a very fast rate as shown in figure 2-1.

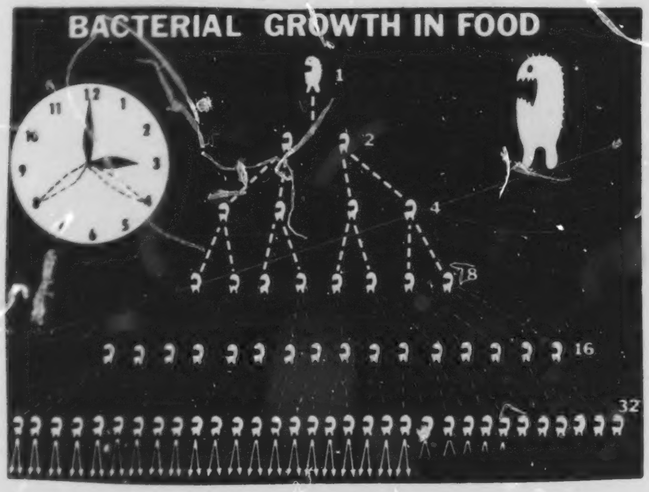


Fig 2-1. Rate of bacterial growth in food.

(4) Thermal death time. This is the length of time required to kill all the bacteria in a given substance at a stated temperature. There is a definite relationship between time and temperature; therefore, they can never be separated. Equal results can be obtained by using a higher temperature for a shorter period of time or, within limits, a lower temperature for a longer period of time. A good example of this is in milk pasteurization. Heating milk to 161°F for 15 seconds is equivalent to heating it to 143°F for 30 minutes.

2-3. FOOD SPOILAGE

a. Classification of foods. Foods are classified as they are related to spoilage. Fresh meats, fish, shellfish, vegetables, fruits, and milk products are foods which begin to deteriorate almost immediately after they are harvested. These foods are classified as perishable. Foods which have been processed such as cereals, dried beans, canned foods, and preserved foods can be stored for long periods of time and are classified as nonperishable. Even though they are considered nonperishable, they cannot maintain high quality if they are not handled properly during storage.

b. Causes of food spoilage. The substances that are normally associated with food spoilage are molds, yeasts, and bacteria.

(1) Molds cause food spoilage which is visible to the naked eye. They change the basic nature of the food, yet may be harmless to the person eating it. For example, molds change the sight and smell of a slice of bread (fig 2-2). Molds thrive best on starchy foods foods but will feed on other foods given favorable conditions. Molds are beneficial in the production of cheeses.

(2) Yeasts which are small plants, invisibile to the naked eye grow almost exclusively in foods containing sugar (fig 2-2). Yeast, like mold, spoils food in a way easily detected by the bubbling and foaming. Odor and flavor are also affected. Yeast ferments fruits and produces alcohol in proportion to the amount of sugar present. Yeast is also necessary in the production of bread.

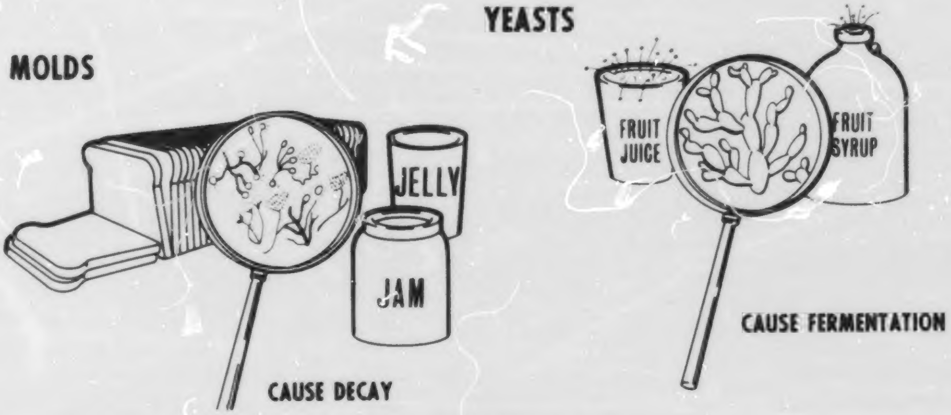


Fig 2-2. Molds and yeasts.

(3) In addition to yeasts and molds, there are many bacteria which cause food spoilage. Bacteria require considerable moisture and can live in varying temperatures. Some need air and some do not. Spores of bacteria are far more resistant to heat than the spores of yeast or molds. Bacteria spores are dangerous because they are difficult to destroy. Bacteria bring about food spoilage which may be harmful, but the major danger in bacteria spoilage is that it may not be detected until infection or disease has become evident. Bacteria, especially the pathogenic (disease producing) types, do not usually alter the appearance or taste of foods.

(4) Growing plants, animals, and the water used in preparing food and drink all carry a bacterial population. Additional contamination occurs as foodstuffs are harvested and transported. The mechanical damage in transit increases food spoilage. As a result, foods so exposed are altered either chemically, physically, or both and the resulting condition is known as food spoilage. The more bacteria, mold, or yeast present in a food, the more quickly spoilage occurs. Therefore, cleanliness in the handling of any food will have a marked influence upon the length of time it will keep.

2-4. FOOD-BORNE ILLNESS

a. Introduction.

(1) Some years ago ptomaine poisoning was a general term used to describe illnesses in human beings believed to be caused by spoiled food. We no longer use ptomaine as a general term to cover all uncertain symptoms of intestinal disorders such as abdominal pain, vomiting, or diarrhea. Food-borne illness is the proper term which refers to illnesses caused by food infections or food intoxication.

(2) Before proceeding further you should know the differences in the terms used when discussing food-borne illness.

(a) Toxins are poisonous waste products given off by an organism. They cause contamination of food and subsequent illness in humans. Botulism is an example of a toxin given off by the Clostridium botulinum bacteria.

(b) Food infection is a term used to describe a food-borne illness which is caused by eating foods containing bacteria which later multiply within the body and produce disease. The food is merely the carrier, much as a handkerchief or drinking cup containing bacteria would serve that purpose. An example of a disease termed as food infection is salmonella food infection.

(c) Food intoxication is a term used to describe a food-borne illness caused by eating a food containing a poisonous substance (toxins). An example of a disease termed as a food intoxication is botulism food intoxication.

(d) Food poisoning is a term used synonomously with food intoxication to describe any outbreak of illness which follows a specific meal and can be traced to a specific food or foods in that meal.

b. Types of food-borne disease.

(1) Natural poisons. These are caused by eating foods which are naturally poisonous. An example of a plant species which is poisonous to man are certain mushrooms. There are 70 to 80 species of poisonous mushrooms. The most poisonous is the Amanita which can cause a serious to fatal illness in an adult after he has eaten only two or three of these fungi. Rhubarb leaves contain such a high concentration of oxalic acid that they have also caused illness when eaten as greens. Sprouting potatoes occasionally contain a poison due to the accumulation of solanin formed during sprouting. Certain species of fish become poisonous during the spawning season, and clams and mussels in some areas become poisonous during the summer months. Tropical fish such as toadfish, puffer fish, and barracuda in tropical waters at certain seasons of the year are also poisonous.

(2) Chemical and metallic poisons. Chemical poisoning is usually accidental. Some poisonous powders are easily mistaken for baking powder, baking soda, flour, or sugar. You should never store cleaning agents in a food storage area because of the chance that someone may accidentally take a can of chemical cleaner instead of baking powder. This is very easily done especially if the person is in a hurry, fails to read the label, and just grabs what he thinks is the item he wants.

(a) Chemical poisons, such as arsenic, are used in some fruit and vegetable sprays. Arsenic is very toxic and symptoms may occur within several minutes to several hours. Symptoms of arsenic poisoning include nausea, vomiting, and abdominal pain. Because of the presence of arsenic in sprays, it is imperative that all fruits and vegetables be thoroughly washed prior to serving.

(b) Metallic poisoning may result from ingesting food prepared in poor-quality gray-enamel utensils, cadmium-plated ice trays or water pitchers, or galvanized iron containers. Acid foods such as lemonade, vinegar, tomatoes, and fruit juices or punch served in plated pitchers cause the metallic plating to dissolve. This can cause metallic poisoning. This type of poisoning has been practically eliminated since we no longer use plated food-serving utensils. The old belief that "tin" poisoning results from leaving food for a period of time in open cans has given away to the modern knowledge that foods can be safely stored in an open can if properly covered and refrigerated. It is true that a few acid foods such as tomatoes may dissolve some iron from the can and result in a "tinny" taste. This taste does not indicate metallic poisoning and the off-flavored foods would not be injurious if ingested. Small amounts of iron and tin salts do get into canned foods but, according to chemical analysis, the quantity is too small to produce any harmful effects.

(3) Bacterial food-borne illness. About 97% of all food-borne illness is caused by bacteria. The foods most commonly incriminated in outbreaks of food-borne illness are meat mixtures such as hash, hamburger, creamed beef, crab, lobster, chicken and turkey salads, bread dressing, and ham. Milk and egg products such as custards and cream puffs have also been the cause of food-borne illnesses. These foods have three things in common: they contain moisture, are warm, and supply protein. These are ideal for the growth of bacteria. It is important that you remember that these organisms do not necessarily change the color, odor, appearance, or taste of the food they affect. Food-borne illnesses caused by bacteria are divided into two types: food infection and food intoxication.

(a) Food infection. Specific organisms are responsible for producing true food infections. The illness comes from consuming the disease-producing bacteria. The food is merely the carrier. The list of such bacteria is a long one; however, food service personnel should be acquainted with the most prevalent ones. The following are eight of the most common infections.

1. Typhoid. The food-borne infection known as typhoid is an ever-present threat because of the possibility of contamination by human carriers. A carrier is a person who has the disease, but who does not show the symptoms. Typhoid-producing organisms can live outside the human body and thus can survive conditions which other organisms cannot. This is why the disease can be transmitted through drinking water. Typhoid organisms can survive for about 1 week in polluted water. Oysters from nonapproved sources eaten in the raw state may transmit the disease. A great majority of epidemics of typhoid fever in recent years have been traced to raw unpasteurized milk. Most cases can be traced to a particular dairy having an employee who is a carrier of the typhoid organism. Transfer of typhoid by way of contaminated fingers is also an important factor in an outbreak of the disease. Since typhoid bacilli are readily killed by heat and chemical disinfectants, temperatures used for the pasteurization of milk will destroy the organisms. Typhoid bacilli multiply rapidly in most protein foods, but their growth in milk is extremely rapid. Immunization, which is mandatory for food service personnel, is the single most important prevention against the spread of typhoid fever.

2. Bacillary dysentery. Dysentery is a general term used to refer to an illness characterized by diarrhea. Bacillary dysentery is caused by the organism "Shigella," an infectious agent common wherever sanitation is a problem. Crowded, unsanitary living conditions, where personal contact is unavoidable, spread the disease. Personal cleanliness is an important factor in its control.

3. Scarlet fever. Many outbreaks of scarlet fever are traced to raw milk, although the disease is more often transmitted by direct contact from person to person.

4. Diphtheria. Diphtheria is an acute throat and upper respiratory infection. Germs are passed from person to person by hands or by any inorganic material (handkerchiefs, cups) which has become contaminated with nasal discharges from anyone infected with the disease.

5. Tuberculosis. The human type of tubercle organisms (tubercle bacilli) are passed from person to person through some form of personal contact, most often by fingers soiled with mouth secretions. Coughing also discharges germs, so that, wherever poor personal hygiene and crowded conditions exist, there is danger of spreading tuberculosis.

6. Septic sore throat. This infection of the throat is characterized by severe, acute soreness and fever. Raw milk is a principal carrier of the organism. To prevent growth of the organism, milk must be kept below 50°F from the time it is drawn until it is pasteurized.

7. Infectious hepatitis. This is a liver disease with symptoms of fever and discomfort. Jaundice or other signs of liver injury are sometimes present. The disease is highly contagious. Drinking water, unsanitary conditions, and flies or other biting insects may transmit the infectious material.

8. Salmonella food infection. Salmonella bacteria are organisms which can live in the intestines of man, mammals, and birds (chickens, turkeys, and ducks). Salmonella food poisoning is caused by ingesting these living organisms (salmonella). The bacteria are transmitted by foods which have been contaminated by contacts with infected persons, animals, and rodents. Since they are so widespread in nature, the control of salmonella in foods presents a serious problem to the food processor. Salmonella find their way into a majority of kitchens; but because of food-handling methods practiced in this country, few cases of salmonella poisoning occur. The organisms can be killed merely by cooking food at normal baking or cooking temperatures for a sufficient length of time to allow the internal temperature to reach and hold pasteurization temperatures. Elimination of salmonella carriers by a food handler's physical examination prevents contamination from this source, and effective insect and rodent control measures reduce the danger of contamination from another common source. Likewise, the proper inspection and refrigeration of foods is a must.

(b) Food intoxication. Food intoxication is caused by a specific toxin (poison) produced outside the body. The bacteria developing within the food item form an external toxin which is responsible for the illness. Two principal kinds of food poisonings are caused by toxins: staphylococci food poisoning and botulism.

1. Staphylococci food poisoning. This is a serious problem in the preparation and serving of food. It is the most common type of food poisoning and accounts for about 90% of all recorded cases. Staphylococci bateria grow very rapidly. Food contaminated with this toxin causes an acute intestinal disturbance within 1 to 6 hours. The toxin is found in boils, pimples, infected cuts, pus, sores, nasal drip, and sprays expelled by sneezing or coughing. A high degree of personal hygiene must be maintained by all food service personnel, particularly the washing of hands after using rest-room facilities. The type of food associated with staphylococci food intoxication varies. Ham and fowl are most commonly involved. Ham may become infected because of the practice of boning and slicing the ham hours before serving and holding without refrigeration. Also, highly salted ham permits the growth of staphylococci, but inhibits the growth of many other bacteria. Other foods commonly involved are canned or potted meats or fish, beef, cheese or milk products, cream or custard-filled pastries, and potato and macaroni salads. The occurrence of staphylococci poisoning can be greatly reduced by careful attention to cooking temperatures and proper refrigeration.

2. Botulism. Any poisoning by the toxin (poison) of Clostridium botulinum causes a food poisoning called botulism, which may infect preserved food, especially sausages and canned meat and fruit, or fodder, especially silage. This type of food poisoning is often fatal. It is one of the most powerful poisons known to man. Only 1 milligram of the toxin (1/28,000 oz) is needed to cause the death of 8,000 people. The toxin is destroyed in 5 minutes by heat at 212° F (boiling temperature of water), the bacteria being themselves very heat-resistant and apparently nonpathogenic (nonpoisonous) in the body.

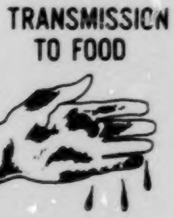
NOBODY FOOLS AROUND WITH C. BOTULINUM!

   a. Growth requirement. Botulism must have an environment which is free of oxygen to grow. It is most often found in underprocessed or unsterilized canned foods.

   b. Indications. Although you may not be able to tell by the color, odor, or taste of a food that it is contaminated, if you open a can and find that its contents do have an unusual odor, or color, do not taste it or serve it. If the food is even suspected of containing botulism it should be destroyed. Swollen or leaking cans have indicated the presence of botulism. Therefore, no swollen or leaky container should be opened or served unless approved by the medical authority. Exceptions are swollen cans of molasses and coffee. Cans of molasses that bulge at the ends are not unusual, particularly in the warmer climates. Micro-organisms cannot exist or multiply in an enviroment so high in sugar content. Care should be taken NOT to discard cans of roasted coffee or ground coffee which are swollen or bulged: a bulged coffee can indicates a properly sealed container that has retained its natural gases.

(4) Parasitic food-borne illness. A parasite is an organism which derives its food and other necessary substances from another living organism. The most important of these organisms include a protozoan parasite, three types of tapeworms, and a roundworm.

(a) Amoebic dysentery is caused by a protozoan parasite which is transmitted by food or drinking water contaminated by sewage or a human carrier. Human waste is transmitted by the hands or by flies and other insects to the food or water. To maintain any degree of control over amoebic dysentery, personal hygiene and sanitation practices must be effective.



(b) Tapeworms have been recognized since early times as intestinal parasites in man. Infection occurs when uncooked meat containing the worms is eaten. Man can get tapeworms from pork, fish, and beef. If U.S. inspected beef is used, tapeworms from this source are eliminated. The use of fish from foreign waters may constitute a problem unless thoroughly cooked.

(c) Trichinosis is a disease caused by the roundworm Trichinella spiralis. It is transmitted by eating insufficiently cooked infected pork. Pork must be cooked to at least an internal temperature of 137° F to kill the immature worms. These worms are encysted in the muscles and tissues of hogs. When they are freed from their covering by the digestive juices of man, they grow to maturity, and reproduce in man's small intestines. The newborn worm then makes its way through the bloodstream to various parts of the body and becomes encysted in the muscle fibers (fig 2-3), causing trichinosis. Many cases of trichinosis pass undetected; however, tests show that 10% to 20% of adults have had at least a mild trichinosis infection at some time in their lives. Inspection to detect hogs infested with trichina worms is too difficult and too expensive to be required. Therefore it is important that, whenever you serve pork or pork products, you must cook them well-done. Pork is considered to be cooked well-done when the meat is white.

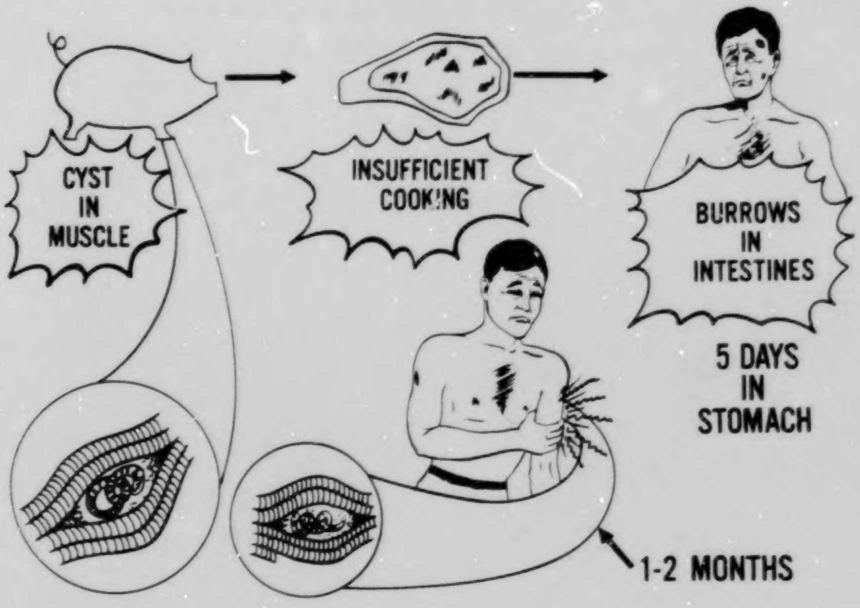


Fig 2-3. Life cycle of Trichinella spiralis.

2-5. PREVENTIVE MEASURES

Preventive measures are plainly indicated once the source of infection is known.

a. Meats must be procured from approved sources and must be properly refrigerated.

b. Food, especially meat mixtures, should not be prepared and set aside to be served at subsequent meal. The time between the preparation and serving of food must be kept to a minimum. If it becomes necessary to hold any food, it should be put in shallow pans and refrigerated immediately until it is to be served or prepared for serving. Food should be stored in a refrigerator in a manner which will permit free circulation of air.

c. Experience has proved that it is not a good practice to prepare sandwiches containing meat, fish, fowl, or meat products that are to be served several hours after preparation unless the sandwiches can be refrigerated. If made from canned meats or meat products, sandwiches should be prepared only by opening the can immediately before serving. If cooked meats are used, the sandwiches should be prepared in the galley and kept refrigerated.

d. A high standard of sanitation in all food service areas is essential. The personal hygiene of all food service personnel should be observed, particularly the washing of hands after visiting the restroom facilities. Food service personnel with a communicable disease, or with open lesions, particularly on the face, neck, arms, or hands should be prohibited from performing duty in the dining facility until pronounced fit for resumption of duties by the medical officer.

Chapter 3

SANITATION

Section I. INTRODUCTION, RESPONSIBILITIES, AND HEALTH STANDARDS

3-1. INTRODUCTION

Sanitation is simply a matter of achieving and maintaining a high state of cleanliness. To you, sanitation should be a way of life. It will not take you long to realize how the people you work with and the men you serve feel about sanitation. Cleanliness in the preparation and serving of food is most important to everyone from the commanding officer down to the newest private. Even if we did not consider the harmful effects upon health that a lack of sanitation creates, we would still have the fact that no one enjoys food which is prepared and served under dirty, unsanitary conditions.

We, as food service personnel, have an obligation to the people we serve. We must always devote our attention to cleanliness and hygiene, both in our work areas and living quarters and to ourselves. If one man is inattentive to his responsibility for sanitation, he may endanger the health and the lives of many other people who are dependent on him for wholesome food served in clean healthful surroundings.

3-2. RESPONSIBILITIES

a. Individual commands. The individual command has the ultimate responsibility for insuring that the food and beverages served are safe and wholesome. Regulations specify that the CO (commanding officer) is responsible for the health and welfare of his men. Regulations also require that each meal served in the enlisted dining facility be sampled by an officer detailed by the CO for that purpose, usually the officer of the day. Should this officer find the meal unsatisfactory as to quantity, quality, preparation, or presentation, or should any member of the dining facility object to the quantity or quality of the food the CO must be notified immediately.

b. Food service officer. Is in direct charge of the food service section of the command. He is responsible for:

(1) The cleanliness and sanitary maintenance of all food service equipment and subsistence storage areas.

(2) The supervision of the personal hygiene practices of his personnel.

(3) Maintaining proper sanitation procedures throughout the food service section.

(4) Sanitary preparation of food.

(5) Illnesses which result from improper handling, preparation, or serving of food (directly responsible).

c. Medical officer. Is responsible for:

(1) The sanitary surveillance of the storage, preparation, and serving of food and the disposal of food residues.

(2) The sanitary surveillance of food service areas and the proper cleaning of equipment and utensils.

(3) The inspection of subsistence items to determine their fitness for human consumption, and to insure the receipt of subsistence items from approved sources.

(4) The physical examination of all food service personnel for disease or unclean habits that could result in food-borne illness.

(5) Providing technical guidance and assistance regarding sanitary food preparation.

3-3. HEALTH STANDARDS

a. Physical examinations. Food service personnel are a most important link in transmitting diseases through food. The health and personal hygiene habits of food service personnel are vital factors which affect the health of the men they serve.

(1) All food service personnel must be examined and found free from communicable disease prior to being assigned to a food service operation.

(a) Military. The examination of military personnel includes a review of the individual's health records for current chest X-rays, immunizations, and medical history. A personal interview concerning personal hygiene habits is also held.

(b) Civilian. The examination of civilian food service personnel should include a chest X-ray which must be repeated at least annually.

(2) All food service personnel who have been away from their duties for 30 days or more must have another medical examination.

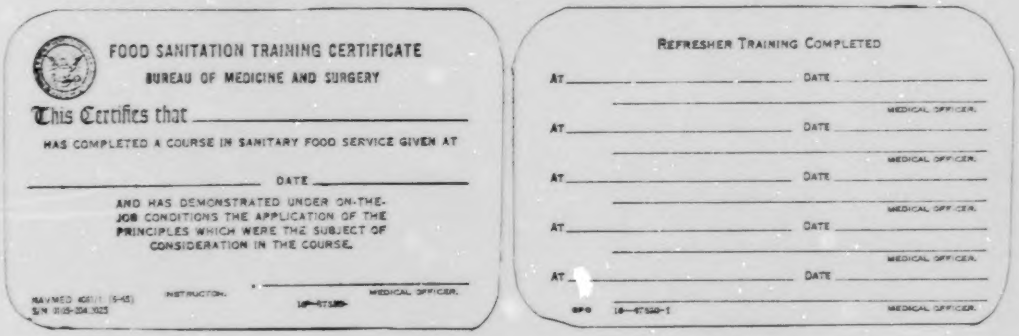
(3) Personnel having open lesions, particularly of the hands, face, or neck, acne of the face, or who have a communicable disease are prohibited from performing further duty in the dining facility until pronounced fit by a medical officer.

b. Training. All food service personnel must receive instruction in food sanitation.

(1) Initial instruction and subsequent semiannual refresher training is given to all food service personnel assigned for periods of 30 days or longer. The food service attendants assigned for food service duties for less than 30 days should be given on-the-job training by competent supervisors. Permanent food service personnel should receive continuous on-the-job training and instruction by supervisors.

(2) A minimum of 6 hours for initial training and 3 hours for annual refresher training is required for all food service personnel. This in no way limits the amount of training necessary to meet specific requirements for each food service facility. When feasible, a portion of the training program should be presented in the food service area. This will provide an effective means whereby actual food service equipment and utensils can be utilized to demonstrate correct and incorrect usage.

(3) Food Sanitation Training Certificates (fig 3-1) will be issued to all military and civilian personnel when they have completed the initial training period. They or their supervisors are to retain custody of these certificates. Refresher training can be recorded on the reverse side of the certificate.



FOOD SANITATION TRAINING CERTIFICATE

BUREAU OF MEDICINE AND SURGERY

This Certifies that ______________________

HAS COMPLETED A COURSE IN SANITARY FOOD SERVICE GIVEN AT

______________________ DATE ______________________

AND HAS DEMONSTRATED UNDER ON-THE-JOB CONDITIONS THE APPLICATION OF THE PRINCIPLES WHICH WERE THE SUBJECT OF CONSIDERATION IN THE COURSE.

INSTRUCTOR.

______________________ MEDICAL OFFICER.

REFRESHER TRAINING COMPLETED

AT ______________________ DATE ______________________

______________________ MEDICAL OFFICER.

AT ______________________ DATE ______________________

______________________ MEDICAL OFFICER.

AT ______________________ DATE ______________________

______________________ MEDICAL OFFICER.

AT ______________________ DATE ______________________

______________________ MEDICAL OFFICER.

AT ______________________ DATE ______________________

______________________ MEDICAL OFFICER.

Front of card:
place of instruction, data completed,
signature of instructor

Back of card:
refresher training completed

Fig 3-1. Food Sanitation Training Certificate.

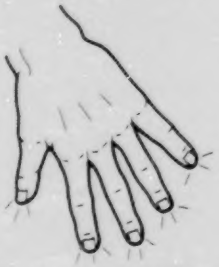
Section II. PERSONAL HYGIENE

3-4. RULES TO INSURE PERSONAL HYGIENE

a. Importance. The group of rules and principles designed to promote personal health and cleanliness is known as "personal hygiene." Personnel who practice these rules and principles reduce the possibility of contaminating food, drink, or the cooking and serving utensils. If a food service man is to effectively carry out the sanitation program in the dining facility he must first keep his own body clean. Every person who is involved in food service is expected to use soap and water generously in keeping himself clean. The following list contains some of the procedures which should be followed to insure personal cleanliness.

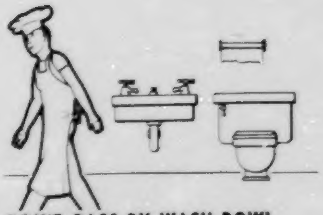
(1) Keep your fingernails short and clean. A nail brush is a good investment. If your fingernails get dirty easily, they are probably too long.

CLEAN SHORT NAILS



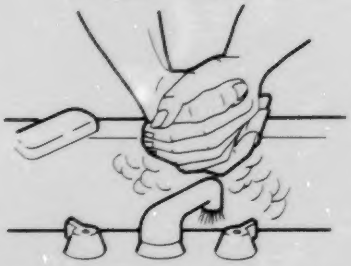
REDUCES DISEASE TRANSMISSION

(2) Wash your hands frequently. They should be washed immediately before going on duty, after every visit to the head, after using a handkerchief, and after each contact with anything that might be a source of germs. Each hand-washing must involve soap and water, not simply running water over the hands.



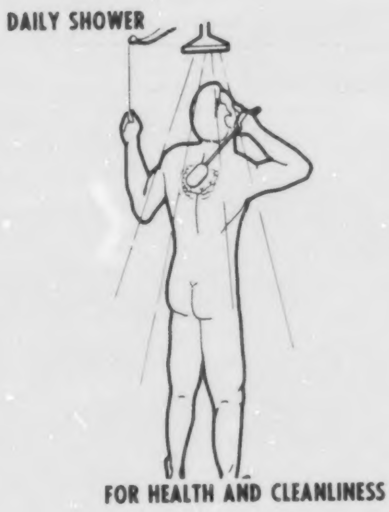
DON'T PASS BY WASH BOWL
WASH HANDS

FREQUENT HANDWASHING



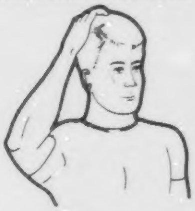
VERY IMPORTANT

(3) Take one good shower per day as a minimum. During hot weather or when perspiring heavily as a result of hard work, you should take two or three showers each day as needed.



(4) Brush your teeth after each meal. A proper brushing schedule will include brushing five times each day, i. e. when you get up in the morning, after breakfast, after lunch, after dinner, and just before going to sleep at night. You should also make regular visits to the dentist.

(5) Visit the barber weekly. Remember that you are a Marine and a food handler when you give instructions to the barber. Keep a cover or hairnet on your head at all times when in the dining facility in order to prevent hair or dandruff from falling into the food. Shampoo your hair frequently. Dandruff and other scalp disorders should be given immediate attention.



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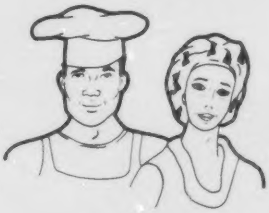
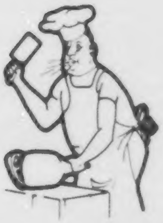


Do

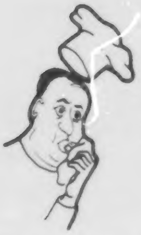
(6) Shave prior to going on duty. A good clean shave each day is considered a minimum requirement.

(7) Start each day with freshly laundered whites. Change them as often as necessary. Soiled or unused clothing should not be permitted to accumulate in your locker. Keep your shoes shined and in good repair. You will find in alternating two pairs of shoes that they will last longer, are less likely to develop a bad odor, and foot trouble will occur less frequently.

(8) Control sneezes and coughs with a handkerchief. If the sneeze or cough persists, report to sick bay.



Don't



Do

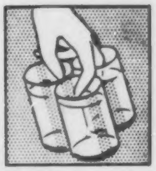
(9) Prohibit the use of tobacco. Smoking in food preparation, serving, or dishwashing areas is prohibited. The use of tobacco while preparing or serving food may contaminate the fingers and hands with saliva, and may induce spitting, which transmits disease organisms present in the saliva to the food or to the food-contact surfaces of dishes or utensils. If smoking areas away from the galley are provided, you should use these areas, but you must also thoroughly wash your hands before returning to your work area.

(10) Get prompt medical attention for all cuts and scratches. You should not be handling food if you have a skin disease, cuts, or sores.

(11) Avoid any personal habit or mannerism not consistent with accepted social customs.

b. Developing sanitary work habits. A wide range of communicable diseases and infections may be transmitted by food handlers to other people through contaminated food and careless work habits. A set of food-handling procedures should be defined for all personnel so that nothing is left to chance. The chief cook and chief food service attendant should inform their personnel of the correct manner for handling food containers and cooking and serving equipment. Some desirable work habits which you should observe to prevent contamination are:

(1) Handle clean cups, glasses, and bowls so that your fingers and thumbs do not contact the inside surface or lip-contact surfaces.



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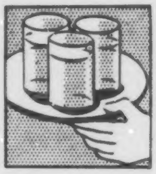

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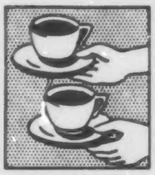

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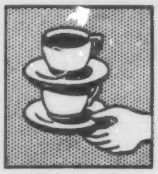
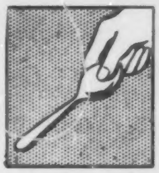


Don't

(2) Pick up and touch clean knives, forks, and spoons only by their handles.



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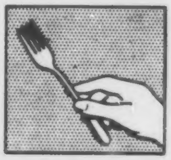
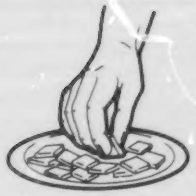


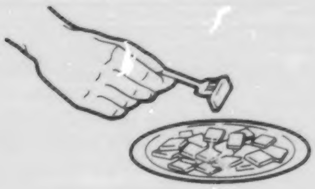
Do

(3) Handle and dispense single-service articles (e. g., 1-pint milk cartons, butter patties, or sliced bread) in such a manner as to prevent contamination of the surfaces which come in contact with food or with the mouth of the user.



DON'T BE A BUTTER-FINGERS

Don't



USE A FORK

Do

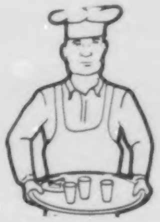
(4) Use tongs, spatulas, serving scoops, ladles, spoons, and other utensils so as to keep contact with the food to a minimum.

(5) Clean can openers, a source of dangerous contamination, by washing and sanitizing after each use. Exercise care in opening cans and other containers to prevent personal contact with the food when removing the lids.

(6) Slice all foods, particularly protein foods, by machine whenever practical. Using foil, glassine, or clean waxed paper to hold foods as slicing proceeds is desirable and will help reduce the amount of contact by human hands.

(7) Do mixing operations in a sanitized bowl of an automatic machine. Mix salads by tossing greens or other ingredients with a clean serving utensil, never with your hands.

(8) Use trays or dollies to transport food containers, utensils, or equipment.



(9) Follow a "clean-as-you-go" policy, maintaining neat and orderly work areas. Close containers after using and return items to their proper place of storage. Wipe cooking surfaces clean of spills, using disposable paper, if available, or cloth wiping rags. All cloth rags should be clean. Keep paper and food off the decks.

(10) When food tasting is required, use the 2-spoon method: using a basting spoon, dip a small amount of the food from the cooking vessel, then use a teaspoon to taste from the basting spoon. After tasting, discard the food remaining in both spoons. Do not dip the teaspoon directly into the cooking vessel. The 2-spoon method of tasting will prevent contamination of the food by germs being transported from the taster's mouth to the cooking food. The utensils used for tasting should be washed and sanitized before they are reused.

Section III. FOOD SANITATION

3-5. INTRODUCTION

Even with exact care in handling, most uncooked foods will harbor some micro-organisms. The growth of these organisms can be prevented or retarded through proper temperature control. Only the quantity of food which will be consumed at each meal should be prepared. To assure a uniform and safe product, food should be prepared and cooked in accordance with the Armed Forces Recipe Service. A good rule to follow is: KEEP HOT FOODS HOT, AND COLD FOODS COLD.

3-6. PREPARING AND SERVING FOODS

a. Cooked foods.

(1) Protein foods. Protein foods which are not served immediately after cooking should be chilled to temperatures of 40° F, or lower (but not frozen) or held at 140° F, or higher (but not boiling). Protein foods include meats and meat mixtures (hash, hamburger, and creamed pies), seafood (including shrimp, crab, and lobster salads), turkey, turkey salad, and turkey dressing, other poultry foods, gravies, meat stocks, soups, eggs, custards, cream fillings, and milk. The growth of harmful bacteria and the development of toxins (poisons) formed by the bacteria occur rapidly in cooked protein foods when held at temperatures between 40° and 140° F. Cooked protein foods which have been held at temperatures between 40° and 140° F, longer than 3 hours are considered unsafe for consumption and must be destroyed. If the product is refrigerated at intervals and then permitted to warm up, the total time of the various periods between 40° and 140° F must not exceed 3 hours. Protein foods composed of ingredients which have been peeled, sliced, or diced by hand after cooking should never by used as leftovers, since the 3-hour limit between temperatures of 40° F and 140° F, is usually taken up in preparing, chilling, and serving the food. These foods include potato salad, chicken salad, turkey salad, macaroni salad, shrimp salad, egg salad, hard cooked eggs, and similar items. Hand preparation not only increases the chance of contamination but also increases the length of time that these foods are held at room temperature. It is also dangerous to return opened jars or bowls of mayonnaise and cooked salad dressing from salad bars to refrigerators for reuse at a later meal. Because of the danger of miscalculating the total lapsed time that these salad dressings have been held at temperatures between 40° and 140° F, mayonnaise and cooked salad dressings should be placed on the salad bar in small quantities and should not be retained for reuse.

(2) Food to be chilled. When leftovers or warm foods are to be chilled, care must be taken to assure prompt and thorough chilling (40° F, or below but not freezing), to the center of the food mass. Foods to be refrigerated should be placed in shallow pans to a depth of not more than 3 inches and covered with a lid or waxed paper. Large deep pans should not be used because the center of the food mass may remain warm for a sufficient length of time to permit the growth of harmful bacteria or the development of a toxin. Any other procedure which might delay cooling must also be avoided. Food to be chilled should be placed in the chill box immediately. It is suggested that the containers be labeled with the time and date the food was refrigerated. Leftover food should not be held for more than 36 hours. Freezing leftovers is prohibited.

(3) Ground food. Food which has been ground or chopped and is to be cooked or incorporated into a recipe at a later time should be refrigerated immediately in shallow pans filled to a depth of not more than 3 inches and must be kept covered until cooked. Grinding or chopping food increases the surface area for possible contamination and growth of harmful bacteria. The grinding process also warms chilled food to the point where bacteria growth may start. Only the quantity of ground foods which will be consumed at each meal period should be prepared. To assure a safe product,

ground or chopped foods should be prepared and cooked in accordance with the methods prescribed in the Armed Forces Recipe Service, MCO P10110.16_.

(4) Meats. Cut, sliced, or diced meats should be placed in shallow containers not more then 3 inches deep, covered with a lid or waxed paper, and refrigerated immediately. Meat cutting and meat preparation rooms should be air conditioned and maintained at temperatures of 50° to 60° F, if feasible. Improper handling of meats can result in souring as well as bacterial contamination.

b. Fresh vegetables. Green vegetables of uncertain origin should be suspected of being contaminated with pathogenic organisms and must be chemically sanitized by immersion for at least 15 minutes in a chlorine solution (or other approved method) and thoroughly rinsed with potable water before being cooked or served. Head items such as lettuce, cabbage, and celery, etc., must be broken apart before sanitizing.

c. Frozen foods. Frozen food should be thawed in a refrigerated space. Freezing tends to break down tissue cells, making the food much more susceptible to bacterial invasion after thawing. Frozen foods, once thawed, should not be refrozen. Frozen food should not be thawed by exposure to excessive heat or immersion in water. The use of fans to speed thawing causes loss of fluid through dehydration and should not be permitted. Frozen meat should be thawed gradually under refrigeration and used as soon as possible thereafter. The ideal temperature range for thawing is 36° to 38° F. During the thawing period, meat should be kept in its original commercial wrapping or container, which provides insulation and permits the meat to thaw uniformly.

d. Reconstituted dehydrated foods. Dehydrated foods such as dried eggs and vegetables after reconstitution are as susceptible to spoilage as the fresh items. Dehydrated foods should be cooked or refrigerated immediately following reconstitution.

e. Pastries.

(1) Cream puffs, custard-filled pies and cakes, eclairs, and similar products, including those containing synthetic fillings, should be prepared under strict sanitary conditions, covered, cooled quickly, and refrigerated until served. These items are highly perishable and provide ideal culture media for pathogenic organisms.

(2) When procured commercially, these items must be delivered under refrigeration, and remain under refrigeration during the serving period. All leftovers must be destroyed at the end of the day.

3-7. SALAD BARS AND SELF-SERVICE ITEMS

a. Salad bars.

(1) Salad bars may be set up on a self-service basis. To assure proper refrigeration, all salad bar items should be placed in pans or in trays and prechilled prior to being placed on the salad bar. The pan or trays should be placed on a bed of ice or on an electrically refrigerated salad bar unit. If ice is used to chill salad bar items, proper drainage is essential.

(2) When the use of an electrically refrigerated unit or ice is not possible, the salad bar should be large enough to accommodate shallow pans or trays of salad bar items which are taken directly from the refrigerated spaces. Because of the high temperatures of most dining areas, easily contaminated foods (salad mixtures containing meat, fish, poultry, eggs, cooked salad dressing, and mayonnaise) should be placed on the salad bar only in small quantities and replenished as needed. All such items remaining on the salad bar after the completion of the meal period should be destroyed.

(3) An adequate number of proper serving utensils for the salad bar should be provided to insure proper sanitation and to aid in keeping the salad bar in neat order during self-service.

(4) Careful attention should be given to the arrangement of salad bar items to eliminate the necessity of reaching over one container of food to use another.

b. Self-service items.

(1) Food items permitted in self-service areas are bread, butter, crackers, relishes and condiments, beverages, and desserts which have been preportioned in individual dishes.

(2) Desserts such as cakes, pies, puddings, and bulk ice cream should not be self-served unless they are set up in individual dishes.

(3) The person in charge of the serving line should insure sanitary self-service conditions by having an adequate number of appropriate serving utensils near or with the foods designated for self-service. Self-service lines must be carefully supervised throughout the meal period to keep foods neatly arranged and replenished as needed.

c. Buffets. Buffet-type meals provide ideal temperatures (between 40° and 140° F) for the rapid growth and multiplication of pathogens. Therefore, it is essential that cooked protein foods not be held for more than 3 hours between 40° and 140° F including the time required to prepare them and the holding time before, during, and after serving. KEEP HOT FOODS HOT, AND COLD FOODS COLD.

3-8. SPECIAL MEALS

a. Sandwiches. Because of the method of preparation, type of fillings, and handling procedures, sandwiches are considered potentially hazardous foods. The following requirements apply in the preparation of sandwiches:

(1) Sandwiches must be freshly prepared, keeping the time between preparation and consumption to a minimum. Prepared sandwiches must be kept under refrigeration until served. No protein food should be exposed to temperatures between 40° and 140° F for longer than 3 hours cumulative time until consumed.

(2) Sandwich fillings containing meat, meat food products, poultry, fish, or eggs that are to be held longer than 3 hours before being consumed must be prepared in an air-conditioned room and refrigerated until consumed.

(3) Sandwiches must not be prepared with hot meats or hot ingredients except for immediate consumption.

(4) Sandwich ingredients, spreads, etc. must be refrigerated until actual use.

(5) Do not spread mayonnaise or catsup on the bread used for making sandwiches, or include pickles as a sandwich ingredient. Issue these items separately.

(6) Sandwiches (other than frozen) over 24 hours old must not be served or sold but should be disposed of as garbage.

(7) The preferred method of handling sandwiches for flight meals is as prescribed above. If it is not feasible to follow this procedure, sandwiches may be frozen and handled in the following manner:

(a) Freeze only freshly prepared sandwiches that contain ingredients suitable for freezing.

(b) Wrap each sandwich separately in a double thickness of heavy waxed paper or sandwich bags. Fold the wrapping material tightly and seal. Mark the wrapper to indicate that the sandwich has been frozen and the date of preparation.

(c) Immediately after wrapping, freeze the sandwiches at 0° F or below. Do not store them for longer than 7 days.

(d) Inform the using units that the sandwiches must be consumed within 5 hours after issue. This time begins when the sandwiches are removed from the freezer.

b. Picnic meals. The 3-hour maximum time permitted for holding cooked protein foods at temperatures between 40° and 140° F is of particular importance in the case of special meals (recreation parties). When preparing and using sandwich fillings containing meat, meat food products, poultry, fish, or eggs, it is essential that close galley supervision and liaison with the using units be maintained to insure continuous refrigeration. These foods should be prepared and cooked in accordance with the methods prescribed in the Armed Forces Recipe Service. Such fillings should not be held longer than 3 hours at temperatures between 40° and 140° F (total lapsed time in the galley and aboard aircraft or boats). Unopened cans of meat, chicken, and tuna may be issued in lieu of meat sandwiches when consumption is not anticipated within the 3-hour time limit between 40° and 140° F. In these instances, bread and butter sandwiches may be issued with the canned items to permit members of the using unit to make their own sandwiches if they so desire.

3-9. EXPRESS SERVING LINES

Many dining facilities have installed express serving lines which are separate from the main serving line. This allows personnel to have a choice of items (hamburgers, freshly prepared sandwiches and sandwich ingredients, french fries, and beverages) rather than the full-course meal. Most items served are potentially hazardous foods, and the 3-hour rule for preparing and serving takes on added importance.

Adequate refrigeration should be provided at or near the express serving line. This will avoid the necessity of carrying the foods from central refrigeration and allowing them to remain out of refrigeration for excessive periods of time. Ground meat mixtures for hamburgers must be prepared as prescribe in paragraph 3-6a (3) to avoid contamination and should be cooked thoroughly to a well-done state.

Recommended sanitary practices must be observed when preparing, handling, and serving foods at these express lines. Careful surveillance is necessary to preclude any possibility of laxness in sanitary measures leading to food-borne illness. Personnel working at these express serving lines should be instructed to use extra caution in handling, preparing, and serving food as these potentially hazardous foods require careful and alert attention to safe recommended food service practices.

Section IV. DISHWASHING METHODS

3-10. INTRODUCTION

Extensive tests have proven that many communicable diseases are transmitted by improperly washed and inadequately sanitized utensils and equipment. The importance of the proper washing and sanitizing of food service equipment and utensils cannot be overemphasized. All food service personnel must be fully alert to the hazards associated with so-called "short cuts" and slipshod dishwashing and sanitizing procedures. Dishes may be washed by hand or machine. Whatever the method, the final result may be either excellent or poor, depending on the knowledge, skill, and conscientiousness of the dishwasher combined with the equipment and materials he uses. A good machine is worthless if not operated properly. On the other hand, the best operator is hindered if he must work with improper or inadequate equipment.

3-11. DISHWASHING AGENTS

a. Detergents. The proper use of an effective detergent in the dishwashing operation is necessary to remove soil from the dishes, to prevent the buildup of film, and to insure sanitation. The proper amount of detergent to put into the machine will depend on the capacity of the wash tank and the hardness of the water. Too little or too much detergent is as bad as none at all. The chief food service attendant should instruct the dishwashing machine operator regarding the amount of detergent to be added to the machine. It is usually necessary to add one-fourth of the original amount of detergent used every 10 minutes to make up for dilution and the increasing food particle load. Care should be taken to avoid adding too much detergent, resulting in carryover into the rinse tank which may cause water spotting on the utensils. Special detergents are available in the supply system for manual dishwashing.

b. Soaps. Soaps are fatty acids that have been treated with lye or another strong alkali to produce soap. When soap is used, grease in the soap combines with grease on the utensils and dishes resulting in a greasy film collecting on the utensils and dishes. The Marine Corps PROHIBITS the use of SOAPS IN DISHWASHING.

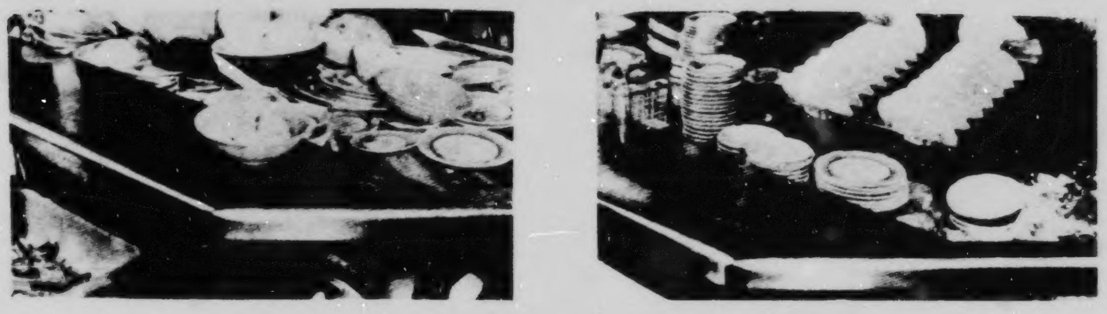
3-12. PREPARING UTENSILS FOR WASHING

Preparation techniques preceding the washing operation provide for cleaner and more effectively sanitized cooking and eating utensils. Scraping and prewashing will prevent the hazard of large amounts of food entering the dishwashing machine or sink to cause a breakdown of detergent and thereby result in a dirty film on the dishes. Grease and food debris left after washing will soil the rinse water. The following directions are for preparing soiled eating utensils and dishes for washing.

a. Scraping and sorting are done at the collection points in or near the scullery.

(1) Scraping is the removal of particles of food from the dishes. It may be done either with the hand or with brushes as the dishes are stacked.

(2) Sorting is the arranging of utensils and dishes by type and size prior to washing. When sorting, place glasses, cups, and bowls upside down. Place knives, forks, and spoons in cylindrical containers with the eating surfaces UP. DO NOT CROWD. Rack saucers and plates of the same size and shape in the same rack. DO NOT OVERLAP. Rack pots and pans for machine washing after a thorough hand washing.



WRONG

Haphazard, poorly organized dishstacking reduces cleaning efficiency.

RIGHT

Well-organized operations improve morale, provide better results.

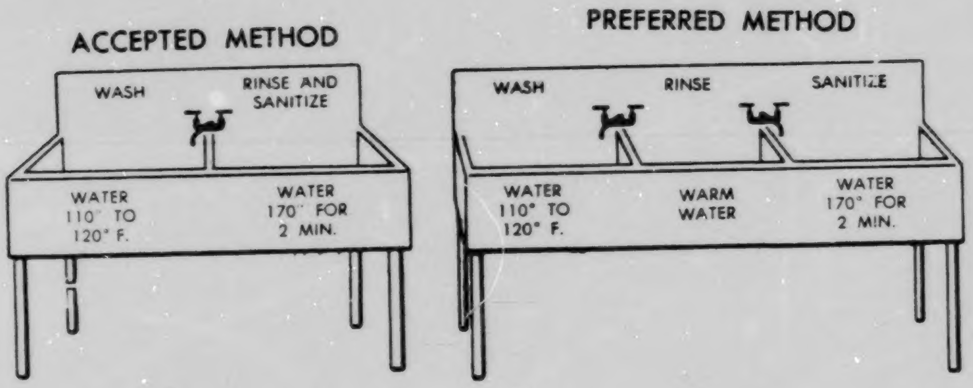
Fig 3-2. Stacking dishes.

b. Presoaking of eating utensils is done by placing the knives, forks, and spoons in detergent water at 130° to 140° F temperature. They should soak no longer than 15 minutes. Scrub stubborn grease and food particles with a stiff brush (particularly the forks). A recommended procedure is to place three dishpans of detergent water at the collection point so the men can place the knives, forks, and spoons in separate pans. Place a knife in one pan, a fork in another pan, and a spoon in the third dishpan. This is the "decoy" method used to insure that the utensils are kept sorted.

c. Prewashing and prerinsing is the removal or softening of grease or food on utensils by flushing with a fine, forceful spray of warm (110° F) water. A good inexpensive type of prerinse equipment may be improvised by using an ordinary shower head coupled to the water supply line by a plastic or rubber hose to allow flexibility. Maintain the water temperature at 110° F and rinse each item separately.

3-13. MANUAL DISHWASHING PROCEDURES

a. Equipment. The equipment for manual dishwashing varies at each dining facility. Some may have the acceptable 2-compartment sink and some may have the preferred 3-compartment sink (fig 3-3).


ACCEPTED METHOD
WASH
RINSE AND SANITIZE
WATER 110° TO 120° F.
WATER 170° FOR 2 MIN.
PREFERRED METHOD
WASH
RINSE
SANITIZE
WATER 110° TO 120° F.
WARM WATER
WATER 170° FOR 2 MIN.

2-compartment sink
(Accepted method)

3-compartment sink
(Preferred method)

Fig 3-3. Methods of hand dishwashing.

b. Accessories. Accessories to the sinks are dip and drain baskets, drainboards, booster heaters to maintain proper temperatures, thermometers, approved brushes, and an adequate supply of hot water. Supplementary equipment should consist of covered garbage receptacles, soiled dish areas with scraping and sorting arrangments, a prewash and prerinse device, and a clean-dish storage area.

c. Washing. After the scraping, sorting, and prewashing has been accomplished, the actual washing procedure begins. The first compartment of the sink should be filled with water as hot as the hands can stand, usually 110° to 125° F (fig 3-4), then the recommended amount of detergent is added.

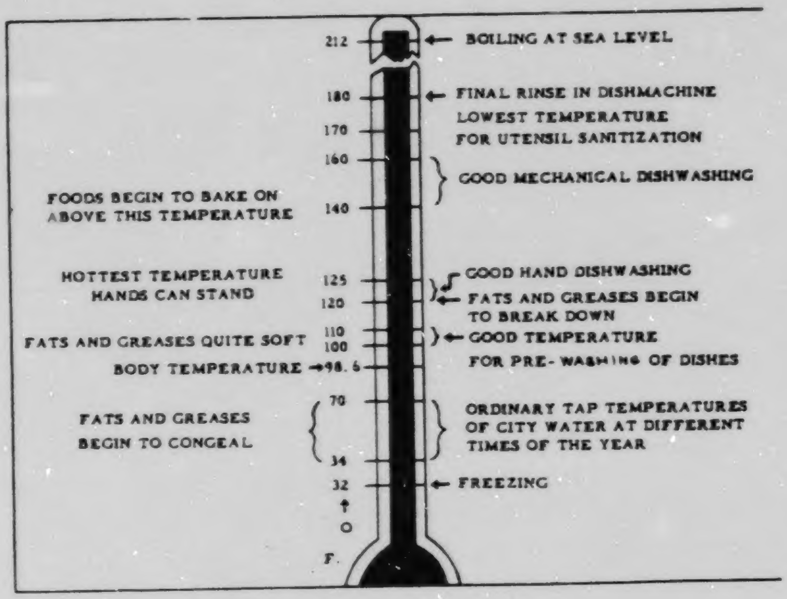


Fig 3-4. Temperatures necessary for the proper sanitizing of food service equipment and utensils.

(1) Glassware should be washed first. Glass-washing brushes (fig 3-5) may be used and may be either two brushes mounted on a rubber pad that adheres to the bottom of the sink by a vacuum cup or machine brushes which are rotated by a small waterproof electric motor. After each glass is washed, it should be placed in the dip and drain basket either on its side or at a steep angle to enable the rinse water to enter the entire depth of the glass and then drain. When the basket is full, lower and raise it a few times in the first rinse tank and then place it into the sanitizing rinse (180° F) and allow it to remain there while the next basketful of utensils is being washed. If you are working with a 2-compartment sink, you will have to flush the utensils under running water or add an additional pan for rinsing. This intermediate rinse is necessary to avoid carryout of detergents, grease, and food particles into the sanitizing rinse which must be kept clean.

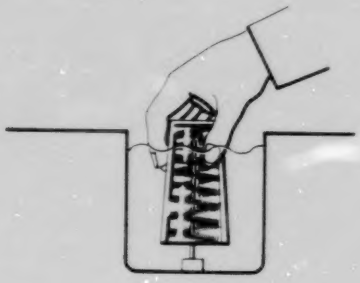


Fig 3-5. Using a glassware brush.

(2) After washing the glassware, you wash the silverware. First you sort and soak the silverware, next you brush it by hand, and then you wash and sterilize it.

(3) The dishes should be washed next, followed by the pots and pans. Both the wash water and the intermediate rinse water should be changed as frequently as necessary.

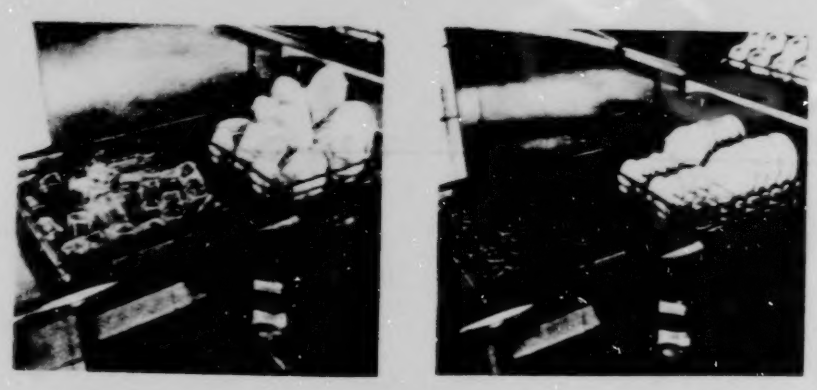
d. Sanitizing. The utensils in the dip and drain baskets are immersed in the sanitizing rinse for at least 1 minute at 180° F (fig 3-4). Then the dip and drain basket is lifted onto the drainboard to allow the utensils to air-dry before storage. While the first basket is drying the second basket can be lowered into the sanitizing rinse, and so the process is continued with the soiled utensils kept completely separated from the clean and sanitized utensils.

e. Maintenance. All the dishwashing equipment must be cleaned thoroughly before the operator leaves the area. The sinks, drainboards, and dip and drain baskets should be thoroughly scrubbed and rinsed. Glass washing brushes should be rinsed and set aside to air-dry to prolong the life of the brushes. The bulkheads and decks should be scrubbed to remove any food or grease particles that may have been splashed or spilled.

3-14. MECHANICAL DISHWASHING PROCEDURES

a. Mechanical dishwashing procedures. Basically the mechanical dishwashing procedures are the same as the manual dishwashing procedures: the dishes are scraped and prewashed and the silverware is presoaked and sorted in the same manner. We will, however, list the proper racking procedure for machine washing.

(1) Use separate racks for each different type, size, and shape of article. Do not overlap plates and saucers. Remember, the detergent water spray and the rinse spray must reach all surfaces of the items being washed. Overloading of the racks as well as improper placement of items on the racks will impede the dishwashing operation (fig 3-6).



WRONG

Dishes that are poorly racked cannot get clean.

RIGHT

Properly racked dishes, cups, and glasses will get clean the first time through the machine.

Fig 3-6. Racking dishes for machine washing.

(2) Silverware must be placed loosely in cylindrical containers with the eating surfaces up so that the wash and rinse spray can contact the eating surface. After the silverware has passed completely through the dishwashing machine, invert the silverware by placing a sanitized, empty cylinder over the full cylinder and turn it over so that the eating surfaces of the utensils are down inside the cylinder and have not been touched with the hands. Shake the cylinder to dislodge entrapped water to permit thorough air-drying.

b. Mechanical dishwashing equipment. The equipment used for mechanical dishwashing may vary, due to the manufacturer's design or to age but there are basically two types of dishwashing machines with which you should become familiar: the single-tank dishwashing machine and the double-tank dishwashing machine.

(1) Single-tank dishwashing machine.

(a) Components. The single-tank dishwashing machine consists of:

1. Body. Constructed of stainless steel, used to house the parts of the machine.

2. Tank. A reservoir for storing wash water.

3. Wash chamber. An area located above the tank containing the sprayer.

4. Wash sprayer. A number of slotted tubes located on the top and bottom of the wash chamber. On some models the sprayer may revolve. It is used to spray detergent wash water over all areas of the eating utensils.

5. Rinse sprayer. The rinse sprayer is basically the same as the wash sprayer except that it is used for sanitizing purposes.

6. Control handle. The arm extending out from the body is the control handle. It is used to control the flow of wash and rinse water. Some models may perform this operation automatically.

7. Doors. Most models are equipped with three doors: the entrance, the exit, and the inspection door. The entrance and exit doors open simultaneously.

8. Scrap trays or strainer pans. These are perforated metal pans equipped with handles for removing them from the machine. They are located between the wash chambers and the tank for the purpose of preventing waste from going into the wash tank.

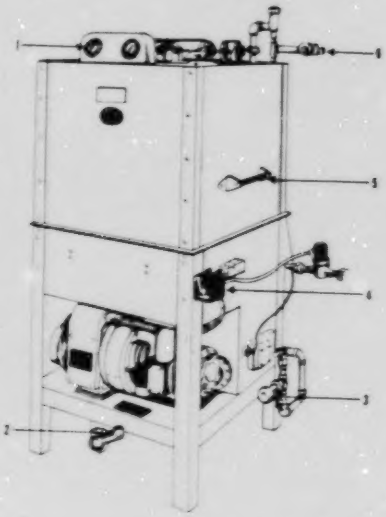
9. Overflow pipe. This is a pipe with a perforated cap placed in the drain opening of the wash tank. It is used to drain excess water from the tank.

10. Drain control handle. The drain control handle extends out from the lower body of the wash tank.

11. Source of heat. The single tank dishwasher may have either a gas, steam, or electric source of heat.

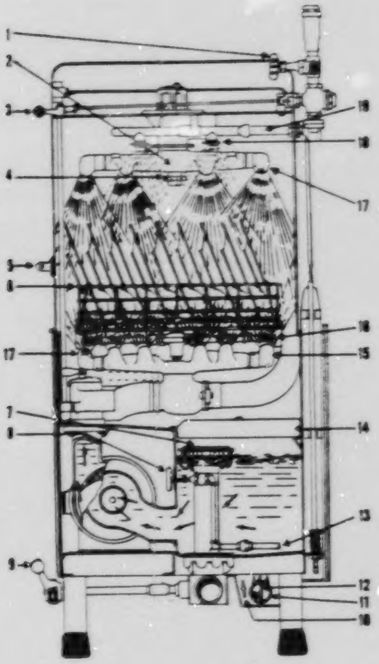
(b) Operating procedures.

1. Inspect machine to see if all operating parts are in order (figs 3-7 and 3-8).

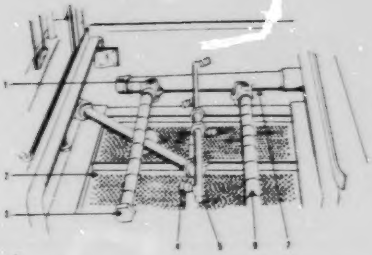


1 Wash and rinse water thermometers
2 Tank drain valve
3 Steam inlet valve (steam heated)
4 Wash and rinse control unit
5 Door handle
6 Hot-water inlet valve

Fig 3-7. Exterior of single-tank dishwashing machine.



1 Hot-water inlet valve
2 Upper revolving wash spray arm
3 Wash and rinse control handle
4 Handwheel for removing wash spray arm
5 Door handle
6 Dish rack
7 Overflow pipe and cap
8 Steam injector valve (steam-heated model)
9 Tank drain valve
10 Pilot light gas valve (gas-heated model)
11 Gas burner (gas-heated model)
12 Gas burner valve (gas-heated model)
13 Steam injector (steam-heated model)
14 Scrap trays
15 Lower revolving spray arm
16 Lower rinse sprayer
17 Wash spray nozzles
18 Rinse spray manifold



1 Wash spray tube locking pin
2 Scrap baskets
3 Wash spray tube cleanout cap
4 Rinse spray nozzles
5 Rinse spray revolving unit
6 Wash spray tube
7 Wash spray manifold

Fig 3-8. Interior of single-tank dishwashing machine.

2. Close the drain control handle.

3. Fill tank to top of overflow pipe with hot water.

4. Turn on the heating unit. The heating unit may vary due to the manufacturer's design. Some dishwashers may even have automatic heating units. Be sure to check the manufacturer's operating instructions.

5. Make a trial run.

   a. Push the wash or rinse button to the ON position on machines equipped with automatic wash and rinse cycles.

   b. On a manual operating type machine, set the wash and rinse lever to the WASH position.

c. Allow the machine to operate for 2 minutes, then set the lever to the RINSE position for 3 minutes.

d. This timing procedure is necessary whether the machine is automatic or manual to draw the maximum amount of water from the source of supply.

6. During the trial run regulate the temperature of the wash water. Read the thermometer on the wash tank; it should read at least 140° F. If it is too low, wait until the proper temperature is reached. If it is too high, regulate the temperature by adjusting the source of heat. Proper dishwashing temperatures are 140° to 160° F. Follow the same procedure to regulate the temperature of the rinse water except that the rinse water temperature should be at least 180° F.

7. Charge the machine with dishwashing compound. Use the recommended type compound for the degree of hardness of the water available.

8. Start the washing process.

   a. Raise the door until it is completely open.

   b. Insert the dish racks into the machine.

   c. Close the door and push the wash button to the ON position. The doors cannot be raised while the wash operation is in progress. The washing time is 40 seconds and the rinsing time is 20 seconds. On manual-type machines, set the wash and rinse lever to the WASH position and allow it to operate for 40 seconds. Stop the wash cycle and set the lever to RINSE, allow 20 seconds for rinsing.

   d. When washing and rinsing are completed, shut off the machine, open the doors, and remove the dish rack.

   e. Repeat step 8 until all the dishes and silverware have been washed.

   f. Turn off the heating unit and drain the tank.

(c) Disassembling and cleaning.

1. Assemble your cleaning equipment. For this operation you'll need a scrub brush, a long-handled, wire spiral brush, a wiping cloth, and a dishpan of cleaning solution. The cleaning solution may be made by dissolving 1 ounce of cleaning compound or other cleaning agent for each gallon of hot water in the dishpan.

2. Raise the door until it is completely open.

3. Remove wash and rinse spray tubes. Follow manufacturer's instructions in this step.

4. Remove scrap trays, taking care not to spill contents into machine.

5. Remove overflow cap.

6. Place the tubes, overflow cap, and scrap trays into a wash sink.

7. Scrub entire interior of dishwasher with a scrub brush and the cleaning solution. Dip a wiping cloth in the solution and wipe the exterior parts of the machine. Take care not to get any water in the motor or any electrical connections.

8. Rinse out the cleaning solution from the wiping cloth and wet the cloth with clean water. Wipe all traces of the cleaning solution from the exterior of the machine.

9. Dry the exterior of the machine with a clean, dry wiping cloth.

10. Unscrew the wash and rinse spray tubes and clean out the cap. Use a long-handled spiral brush and insert it through the open end of the tube, working back and forth

until all particles of food have been completely removed. Use hot running water with the brushing motion. Use a scrub brush and scrub the outside of the tube, working the bristles into the slots in the tubes. If the slots are clogged, open them with a table knife or other suitable instrument. Rinse the tubes in clear, hot running water.

11. Empty the scrap trays into the garbage can and scrub them thoroughly, cleaning out all the residue in the perforations.

12. Allow the tubes and scrap trays to drain dry.

13. Reassemble the dishwashing machine.

(2) Double-tank dishwashing machine (fig 3-9). Is used to wash and sanitize eating utensils in a quick, efficient, and sanitary manner.

(a) Components. The double-tank dishwashing machine consists of:

1. Body. Constructed of stainless steel and houses all the parts of the machine.

2. Tanks. It is a double-tank style machine, one tank stores the wash water and the other the rinse water.

3. Wash and rinse chambers. These are the areas above the tanks containing the sprayers and other parts.

4. Final rinse. Connected directly to the building's hot-water supply.

5. Booster heater. Some buildings may not have an adequate supply of 180° F, hot water. These buildings must have a booster heater installed near the dishwashing machine to insure adequate hot water.

6. Wash and rinse spray arms. Located on the top and bottom of the wash and rinse chambers. They are fed by a centrifugal pump. One set of sprayer arms is for washing, the other set is for rinsing.

7. Conveyor. Used for moving the racks through the machine. Some models use pawls that latch into indentations on the bottom of the racks, moving the racks by a rachet action. Other models use two endless chains, one on each side of the interior of the machine.

8. Doors. Most models are equipped with one or two inspection doors. The entrance and exit on the ends are enclosed with heavy curtains.

9. Curtains. The curtains are heavy textile material. They are placed at both the entrance and exit of the machine and one is located between the wash and rinse chambers to deflect the water to prevent splashing from one area to the other.

10. Source of heat. The water may be heated by gas, steam, or electricity.

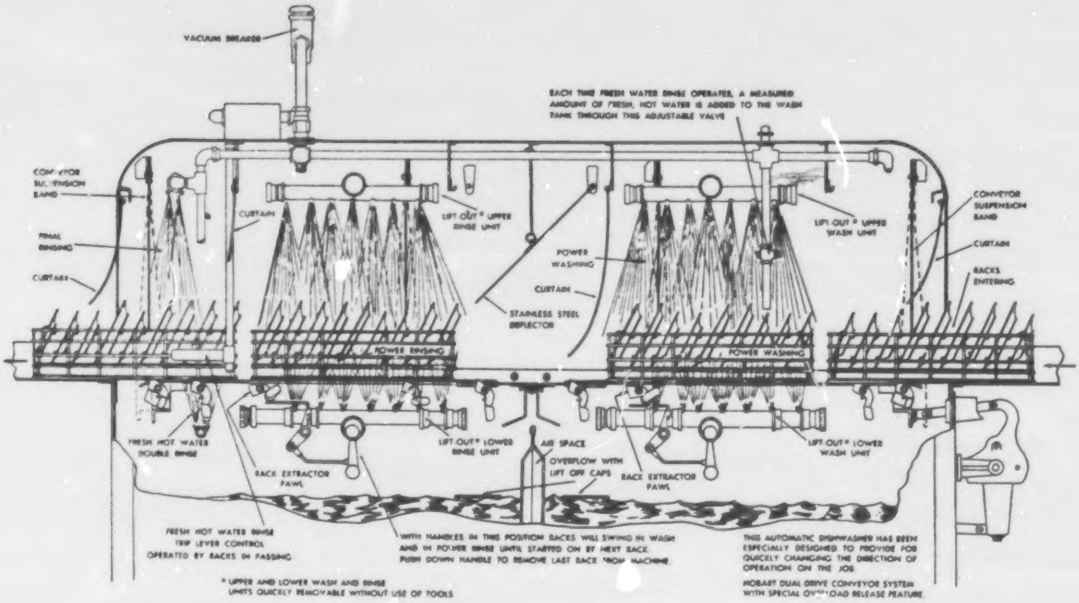
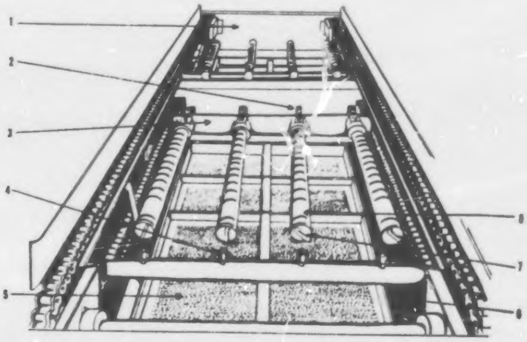

VACUUM BREAKER
EACH TIME FRESH WATER RINSE OPERATES, A MEASURED AMOUNT OF FRESH, HOT WATER IS ADDED TO THE WASH TANK THROUGH THIS ADJUSTABLE VALVE
CONVEYOR SUSPENSION BAND
FINAL RINSING
CURTAIN
CURTAIN
LIFT OUT* UPPER RINSE UNIT
POWER WASHING
CURTAIN
STAINLESS STEEL DEFLECTOR
LIFT OUT* UPPER WASH UNIT
CONVEYOR SUSPENSION BAND
CURTAIN
RACKS ENTERING
POWER RINSING
POWER WASHING
FRESH HOT WATER DOUBLE RINSE
RACK EXTRACTOR PAWL
LIFT-OUT* LOWER RINSE UNIT
AIR SPACE
OVERFLOW WITH LIFT OFF CAPS
RACK EXTRACTOR PAWL
LIFT-OUT* LOWER WASH UNIT
FRESH HOT WATER RINSE TRIP LEVER CONTROL OPERATED BY RACKS IN PASSING
WITH HANDLES IN THIS POSITION RACKS WILL SWING IN WASH AND IN POWER RINSE UNITS STARTED ON BY NEXT RACK. PUSH DOWN HANDLE TO REMOVE LAST RACK FROM MACHINE
THIS AUTOMATIC DISHWASHER HAS BEEN ESPECIALLY DESIGNED TO PROVIDE FOR QUICKLY CHANGING THE DIRECTION OF OPERATION ON THE JOB.
HOBART DUAL DRIVE CONVEYOR SYSTEM WITH SPECIAL OVERLOAD RELEASE FEATURE.
* UPPER AND LOWER WASH AND RINSE UNITS QUICKLY REMOVABLE WITHOUT USE OF TOOLS

Fig 3-9. Interior of double-tank dishwashing machine.



1 Power wash tank
2 Power rinse spray tube locking pin
3 Power rinse manifold
4 Final rinse nozzles
5 Scrap baskets
6 Power rinse tank
7 Power rinse tube clean out cap
8 Power rinse tube

Fig 3-10. Spray tube assembly.

(b) Operating procedures.

1. Inspect machine to see if all operating parts are in order.

2. Close the drain valves on both tanks.

3. Fill both tanks to tops of the over flow pipes with hot water.

4. Turn on the heating unit.

5. Start machine and allow it to run for 2 minutes to allow the wash and rinse water to reach the correct temperature.

6. Regulate the temperature of the water by adjusting the heating unit.

7. Charge the machine with dishwashing compound.

8. Feed the dish racks into the wash compartment, push them until they are engaged by the conveyor. The conveyor will automatically disengage the racks at the rinse end of the machine.

(c) Disassembling and cleaning.

1. The double-tank dishwasher is disassembled and cleaned in the same basic manner as the single-tank machine.

2. The sprayer arms should be removed and cleaned (fig 3-11) after each use to insure proper water pressure. A good, strong spray increases the efficiency of the dishwasher.

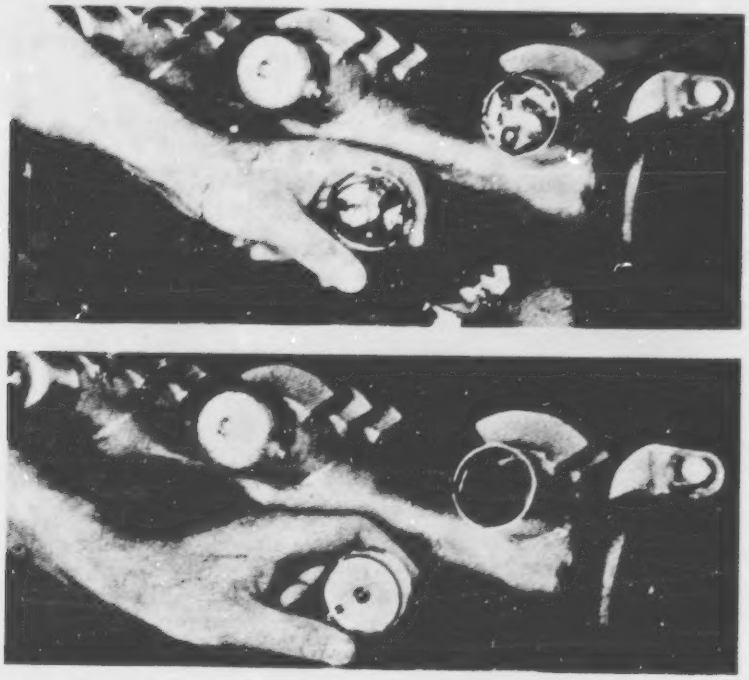
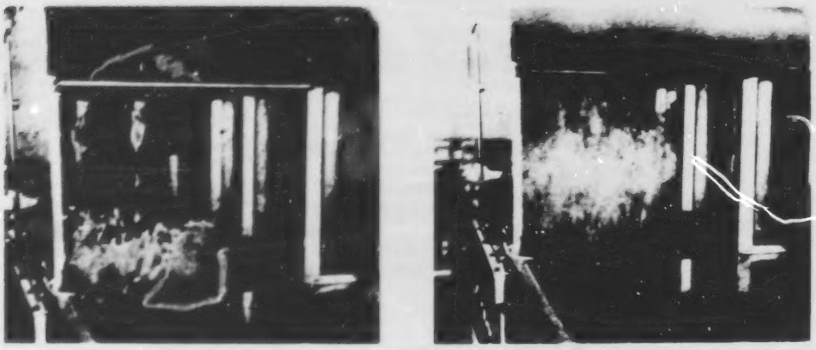


Fig 3-11. Cleaning the sprayer arms.



WRONG

Poor wash pressure is created by CLOGGED SPRAYER ARMS.

RIGHT

Good wash pressure increases the efficiency of the dishwasher.

Fig 3-12. Proper pressure affects the spray efficiency.

c. Safety precautions.

(1) Always inspect the machine prior to operation to insure that all the operating parts are in order and properly installed.

(2) Keep your hands away from all moving parts, especially the conveyor chains.

(3) Keep water away from electrical connections and equipment.

(4) Be sure the water is at the proper level before turning on the heat.

(5) Be sure you turn off the heat prior to draining the water.

(6) Do not place your hands or face into the washing or rinsing chamber while the machine is operating.

(7) Keep the side doors closed when the machine is operating.

(8) Exercise care when feeding racks into the machine to prevent getting hands or clothing caught in the conveyor and to prevent being scalded with hot water.

3-15. SUMMARY

Sanitation is the maintenance of a high state of cleanliness and should be a way of life for all food service personnel. Remember we have an obligation to those we serve to insure that wholesome, well-prepared, and well-presented foods will be served by clean personnel in a clean environment. We must observe the rules of personal hygiene and cleanliness. When preparing foods, we must insure that the temperatures are carefully observed to prevent the spread of organisms which may be harmful. The tableware and utensils must be sterilized. This can be done both in the single or double tank dishwashing machine. Here also we must take care to wash dishes properly and sanitize them at the correct temperatures. The dishwashing machines can also be a source of contamination if they are not properly disassembled and cleaned after each use. The chief food service attendant who allows his scullery personnel to skip disassembling and cleaning the dishwasher completely after the dinner meal in order to secure early is asking for trouble. Sanitation can not be over emphasized; it affects too many individuals as well as entire units.

Chapter 4

FOOD SERVICE EQUIPMENT, UTENSILS, AND SAFETY PRECAUTIONS

Section I. FOOD SERVICE EQUIPMENT

4-1. INTRODUCTION

a. In chapter 3, you learned that high standards of personal hygiene and dining facility sanitation must be applied to prevent the contamination of food. In chapter 4 you will see how these principles of sanitation apply to the use and care of the equipment you use in the galley. To prepare good, wholesome food in an efficient manner, you must know how to properly use the "tools of your trade." You must also follow safety precautions to prevent accidents and maintain a safe working environment.

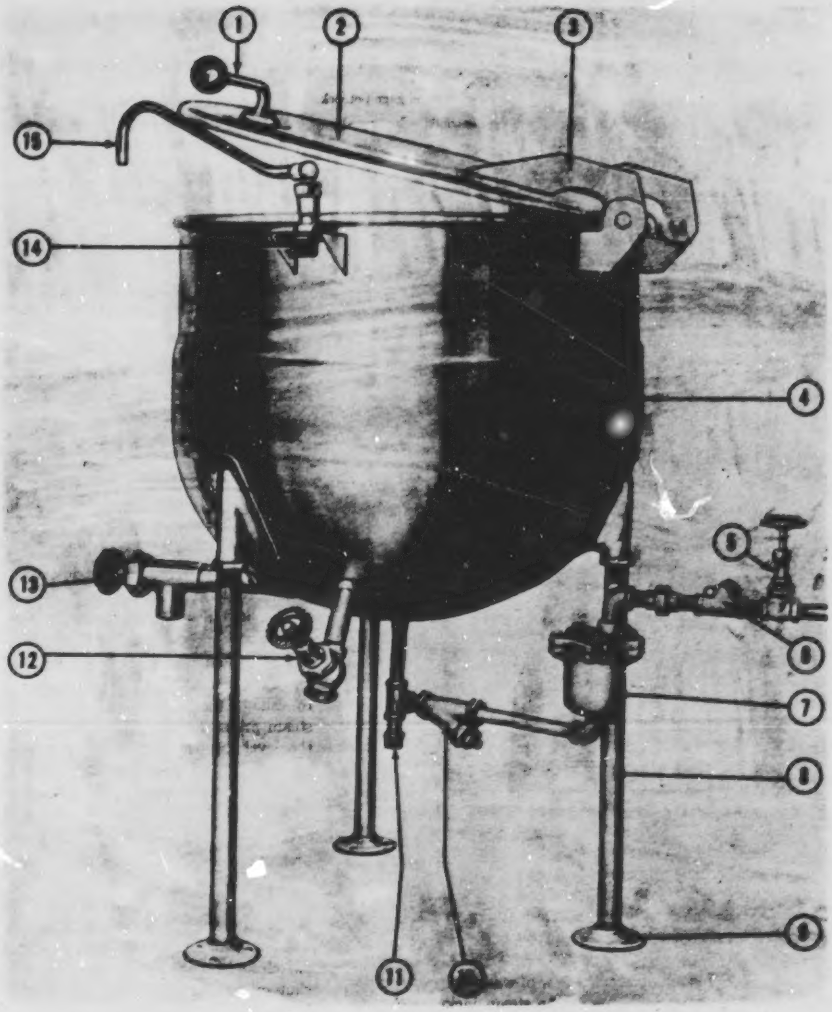
b. At some food service activities, you will not have all of the types of equipment mentioned in this chapter; at others you may have equipment which is not described here. The purpose of this chapter is to help you identify, use, and care for the standard equipment found in most Marine Corps dining facilities. Keep in mind that the food service equipment may be manufactured by different companies. The individual design, style, or size may vary, but the basic opertion, care, cleaning, and safety precautions will remain the same.

c. Section I (para 4-1 to 4-21) will discuss food service equipment; section II (para 4-22 on), food service utensils. Food service equipment is usually too large and bulky to be carried about the galley, whereas food service utensils are items which can easily be carried and are hand-held. Examples of food service equipment; would be stoves, ranges, steam-jacketed kettles, vegetable peelers, refrigerators, dishwashing machines, steamtables, and similar items. Examples of utensils are tableware, knives, pans, and other more portable kitchenware.

4-2. STEAM-JACKETED KETTLES (fig 4-1)

a. Description. The steam-jacketed kettle is used for cooking soups, stews, vegetables, meats, and other foods by simmering or braising. The kettle consists of an inner and outer shell or jacket. Steam circulating between the inner and outer shell causes even distribution of heat for cooking. The kettle is equipped with a hinged lid for cooking items that require a lid during the cooking period. A safety valve, located on the left side of the kettle, prevents excessive steam pressure from building up within the jacket. A chain is attached to the safety valve to permit manual release of pressure when the jacket becomes excessively filled from condensation. Located on the bottom front part of the kettle is the draw-off faucet which may be used to remove thin liquids; however, care must be taken to always use a strainer so that the draw-off faucet does not become clogged with food particles. The strainer is a round metal perforated disk. It is fitted with prongs that fit into the kettle drain opening to hold it in place. This strainer is removable for cleaning purposes. The steam-jacketed kettle comes in various capacities from 20 to 80 gallons.

Fig 4-1. Steam-jacketed kettles.



1 Cover handle
2 Cover
3 Cover hinge
4 Steam jacket
5 Condensate return valve
6 Check valve
7 Bucket trap
8 Leg
9 Leg pad
10 Check valve
11 Sediment trap cap
12 Steam inlet valve
13 Draw-off faucet
14 Waterline connection
15 Swing waterspout

Note: The strainer is not shown, it is located inside of the kettle and is inserted in the drain opening.

Fig 4-2. Steam-jacketed kettle.

b. Operation (fig 4-2).

(1) Close the draw-off faucet.

(2) Place the strainer in place in the kettle.

(3) Place the food to be cooked into the kettle.

(4) Partly open the steam inlet valve.

(5) Release the trapped air and condensed water in the steam jacket. To do this, pull the chain attached to the safety valve lever. Hold the valve open until live steam starts to escape, then release the chain.

(6) Adjust the steam intake until the desired amount of heat is obtained.

(7) Complete the cooking process.

(8) Turn off the steam inlet valve.

(9) Remove the cooked food.

c. Cleaning.

(1) Assemble the cleaning supplies.

(2) Remove the food particles adhering to the inside walls of the kettle by scrubbing with a long-handled scrub brush, rinsing and draining the kettle.

(3) Remove and disassemble the draw-off faucet.

(4) Scrub the interior of the drain pipe, using a long spiral brush in the opening. Work the brush back and forth to remove all food particles adhering to the inside of the pipe.

(5) Replace the draw-off faucet and fill the kettle 1/3 full of warm water.

(6) Add 1 ounce of detergent for each gallon of warm water. Using a long-handled scrub brush, scrub the entire kettle inside and outside.

(7) Drain some of the detergent water into a dishpan.

(8) Allow the remaining cleaning solution to drain from the kettle.

(9) Remove the draw-off faucet, place it in the dishpan of detergent water, scrub it thoroughly, and replace it in the kettle.

(10) Rinse the entire inside and outside of the kettle and draw-off faucet.

(a) Fill the kettle with clear hot water.

(b) Rinse the entire inside and outside by using a long-handled scrub brush to remove all traces of the detergent solution.

(c) Drain the kettle, removing the draw-off valve, rinsing it while removing it.

(11) Refill the kettle and rinse it with clean hot water (180° F).

(12) Drain and air-dry.

d. Safety precautions.

(1) Always open the safety valve to let trapped air escape.

(2) Check for steam leaks.

(3) Do not turn on the steam unless food or water is in the kettle.

(4) Open the steam inlet valve slowly.

(5) Do not tamper with the safety valve or tie it shut.

(6) Use care when raising the lid during the cooking process to prevent being burned by live steam.

4-3. ELECTRIC MEAT GRINDER (fig 4-3)

a. Description. The electric meat grinder is used to chop or grind all meats (cooked or raw) and fat for rendering. The electric meat grinder consists of:

(1) A cast metal body which is the main part of the machine. It contains the motor.

(2) A grinding cylinder which is a hollow circular body for holding the food and chopping parts.

(3) The worm which is a spiral casting used to force the meat through the perforated plate.

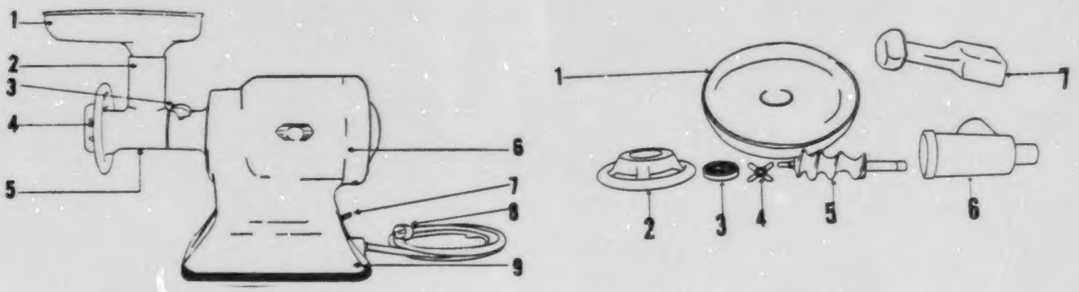
(4) The knife. A sharp 4-edged piece of steel used for cutting or chopping when food is forced against the perforated plate by the worm.

(5) The perforated plate is a round disk with holes which fits against the knife. The meat grinder may be equipped with three or four perforated plates of varying sizes. These plates regulate the fineness of the ground meat.

(6) The adjusting ring is shaped like a wheel and is threaded for attachment to the grinding cylinder. It is used to hold the worm, knife, and perforated plate in place.

(7) The feed pan is a flat metal pan with a short spout which fits into the neck of the chopping cylinder.

(8) The stomper is made of hard wood and is used to force the product being ground through the chopping cylinder.



Legend

1 Feed pan
2 Chopper
3 Locking setscrew
4 Adjusting ring
5 Chopping cylinder
6 Motor
7 Motor switch
8 Cord plug
9 Base

Assembled.

Legend

1 Feed pan
2 Adjusting ring
3 Perforated plate
4 Cutting knife
5 Worm
6 Chopping cylinder
7 Wooden stomper

Assembled.

Fig 4-3. Electric meat grinder.

b. Operation.

(1) Locate the motor switch, feed pan, worm, chopping cylinder, adjusting ring, perforated plate, and knife.

(2) Assemble the food to be ground within easy reach of the grinder.

(3) Place a pan under the end of the chopping cylinder to catch the ground meat.

(4) Make sure that there are no bones or foreign objects in the meat to be ground.

(5) Start the motor and feed the meat from the feed pan through the neck of the chopper and into the chopping cylinder. Do not force the meat, push gently.

(6) Shut off the motor when the work is completed.

c. Cleaning.

(1) Disassemble the meat grinder and carry the parts to the pot sink.

(2) Cover the parts with hot detergent water.

(3) Scrub all the disassembled parts. Clean the perforated plate by scrubbing vigorously with a hand scrub brush until all the holes are thoroughly cleaned and free from food particles.

(4) Place the scrubbed grinder parts in a dishwashing machine rack and send them through the mechanical dishwasher.

(5) Air-dry and reassemble the parts.

(6) Another cleaning operation that maintains the operating efficiency takes place during operation. During operation of the grinder, notice the manner in which the food is forced out from the perforated plate. If the food is not being forced out from most of the holes in the plate the grinder must be shut off and the plate, knife, and worm removed so that any food that may have become bound around these parts can be removed.

d. Safety precautions.

(1) Keep the electric motor dry at all times. The motor housing may be wiped clean with a damp cloth. Never squirt it with a hose.

(2) Remove all bones and foreign objects from the food to be ground.

(3) Never use your hands to push meat into the grinder. Always use the stomper.

(4) Never attempt to remove items from the grinder while it is running.

(5) Unplug the grinder before cleaning it.

4-4. VEGETABLE PEELER

a. Description. The vegetable peeler (fig 4-4) is used to peel potatoes and other root vegetables with the least amount of peeling waste. It is usually located near the vegetable work area and the vegetable storage area. There are various sizes and types of vegetable peelers. Some are floor-mounted and some may be table-mounted. Their capacity may be 15, 30, or 50 pounds. The vegetable peeler consists of:

(1) A round top or lid.

(2) A hopper.

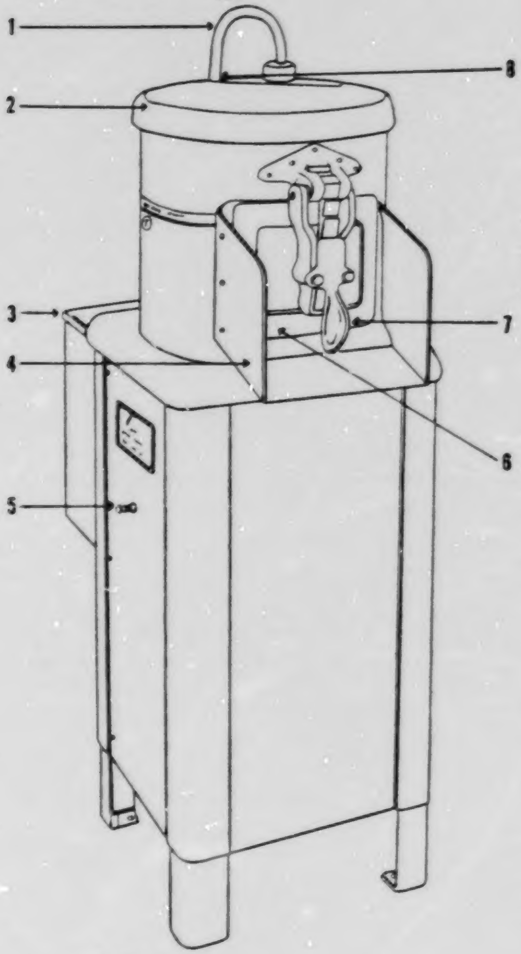
(3) A body.

(4) An abrasive disk that revolves and is removable.

(5) A peel trap which is used to catch sediment and peelings and prevent clogging the drains.

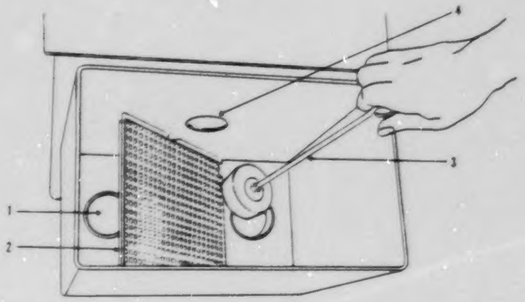
(6) A hinged locking door to discharge the peeled vegetables.

b. Operation. The skin of the potato or root vegetable is removed by the agitation of the revolving abrasive disk throwing the potatoes against the abrasive walls and each other which causes the skin to rub off. The peeler should never be used to peel out the eyes of potatoes or root vegetables. This operation should be accomplished by using the point of a paring knife. After each operation of the vegetable peeler, allow the machine to keep running a few minutes and flush it with clear water.



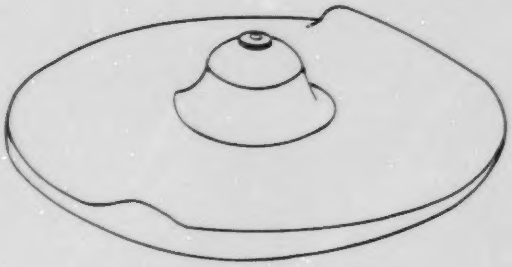
1 Water inlet
2 Removable hopper
3 Attached peel trap
4 Discharge chute
5 Motor switch
6 Discharge door
7 Locking discharge door handle
8 Water inlet valve (not shown)

Vegetable peeler.



1 Connecting sewer drain
2 Strainer screen
3 Stopper for drain of trapped peelings
4 Outlet for peelings and water from peeler

Peel trap.



Abrasive disc.

Fig 4-4. Vegetable peeler.

(1) Locate the lid, hopper, abrasive disk, peel trap, screen, hinged discharge door, water inlet valve, and motor switch.

(2) Bring the potatoes to the peeling area and sort them. Discard spoiled potatoes, stones, and other foreign objects. Sort the potatoes as to large and small size.

(3) Check the peeler to make sure the abrasive disk is in place, the door is closed and secured, and the peel trap is clean and in operating condition.

(4) Turn on the water.

(5) Start the motor.

(6) Load the sorted potatoes into the hopper.

(7) Place a stock pot under the outlet door. Fill the stock pot 1/2 full of cold water.

(8) When the potatoes are peeled, remove them from the peeler by carefully opening the hinged door, allowing the potatoes to fall into the stock pot. Do not shut off the motor or the water.

(9) Refill the hopper and repeat the peeling process.

(10) Check the peel trap frequently, emptying it as required during the peeling process.

(11) After the last batch of potatoes are peeled and the peeler is emptied, allow the peeler to run for approximately 2 minutes to rinse out all peelings and then turn the machine off and close the water inlet valve.

c. Disassembly and cleaning.

(1) Check the electric switch box to insure the electric current is shut off at the switch box.

(2) Remove the hopper by lifting up and out.

(3) Remove the abrasive disk. On some models there are two sunken handles while other models may have a knob on top of the disk. Grasp the handles or knob and lift the abrasive disk up and out.

(4) Remove the peel trap cover and inside screen.

(a) On some models the peel trap is portable; on these, remove the cover and inside basket by lifting up and out.

(b) On models that have built-in peel traps, grasp the ring on top of the stem that the plug is attached to and pull it out. Caution: Have an empty pan placed under the trap plug to catch the peelings.

(5) Carry the disassembled parts to the pot sink and scrub them as stated in chapter 3.

(6) Fill a pail 3/4 full of hot water, add 2 oz of detergent and, using a stiff brush, scrub the entire inside and outside of the vegetable peeler including the peel trap.

(7) Turn on the water inlet valve and rinse the entire vegetable peeler being sure to rinse off all the detergent.

d. Safety precautions.

(1) Never operate the peeler unless water is being properly applied.

(2) Do not reach into the peeler when it is running.

(3) Do not open the hinged door fully or quickly while the peeler is running.

(4) Do not over-load the peeler. Check the rated capacity in the manufacturer's instructions.

(5) Keep water off the electric motor.

(6) Check the abrasive disk prior to starting. Be certain it is securely in place.

4-5. VERTICAL FOOD MIXER

a. Description. The vertical food mixer is used to mix or whip food and liquids in large quantities to a desired consistency at controlled speeds. It should be located near the steam-jacketed kettles in the galley. The vertical mixer consists of a metal enclosed frame and electric motor. It may have a 2-, 3-, or 4-speed transmission and a clutch (either automatic or manual). There are various sizes and types of mixers. Some are floor models which range from 20- to 80-quart capacity and some are table models with a 10- to 20-quart capacity. Some models are equipped with power bowl lift handles.

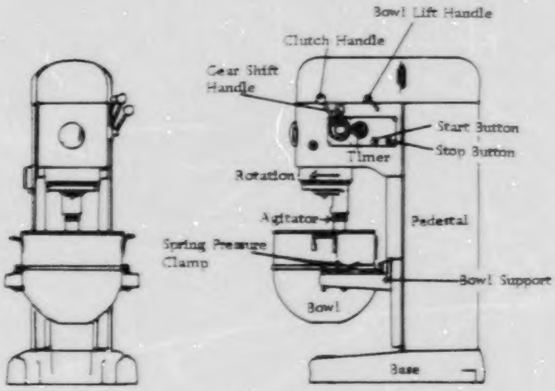

Bowl Lift Handle
Clutch Handle
Gear Shift Handle
Start Button
Stop Button
Timer
Rotation
Agitator
Pedestal
Spring Pressure Clamp
Bowl Support
Bowl
Base

Fig 4-5. Vertical food mixer.

The following is a list of the attachments that may be used with the vertical mixer.

(1) Pastry knife (fig 4-6). The pastry knife is used to cut butter or shortening into flour for pies, biscuits, and pastry shells. It assures a perfect blending of fat and flour for light, airy biscuits and rich, flaky pie crusts.

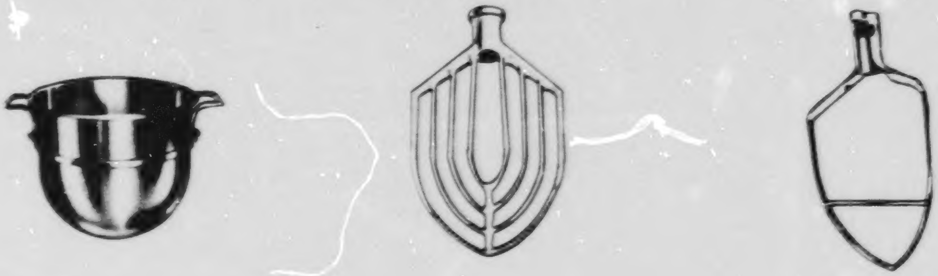
(2) Wire whip (fig 4-6). The wire whip attachment is a cluster of wires made for whipping or lightly beating cream, mayonnaise, eggs, meringues, boiled icings, and angel food and sponge cakes.

(3) Dough arm (fig 4-6). The dough arm mixes and kneads doughs of all kinds for breads, rolls, and coffee cakes. It is sometimes called a dough hook.

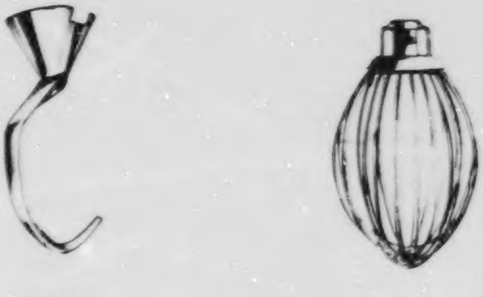
(4) Flat beater (fig 4-6). The flat beater has the widest range of use. It both revolves and rotates in the bowl, giving a compound action which thoroughly mixes and blends all the ingredients. It is used for creaming butter and sugar, it beats batters for butter and egg cakes, and it mashes potatoes and mixes meat loaf.

(5) Adapter rings (fig 4-5). The adapter rings are used on the elevating bowl support to adapt it to smaller bowl sizes.

(6) Mixing bowls (fig 4-6). The mixing bowls are stainless steel and vary in size.



Mixing bowl   Flat beater   Pastry knife



Dough arm   Wire whip

Fig 4-6. Attachments for vertical mixer.

b. Operation (fig 4-5).

(1) Locate the bowl support, spring pressure clamp, bowl lift handle, switch, speed selector, and clutch handle.

(2) Place the clutch and speed controls in the OFF position.

(3) Place the mixing bowl in place on the bowl support. Lock the bowl in place.

(4) Attach the whip or beater to the spindle and turn the whip or beater 1/4 turn or until it is secured by the locking device.

(5) Place the ingredients to be mixed into the mixing bowl. Follow the Armed Forces Recipe Service for the mixing process to follow.

(6) Start the motor.

(7) Start the mixing process.

(a) Set the speed selector to low speed.

(b) Engage the clutch.

(8) Engage the bowl lift handle to raise the mixing bowl.

(9) Complete the mixing process until the ingredients are mixed thoroughly.

(10) Disengage the clutch, place the speed selector in the OFF position. Turn off the motor and then lower the mixing bowl.

(11) Remove the whip or beater from the whip shaft.

(12) Remove the mixing bowl.

c. Disassembly and cleaning.

(1) No disassembly is required of the vertical mixing machine except for removing the whip or beater, the mixing bowl, or other attachments.

(2) Assemble your cleaning supplies.

(3) Clean the entire machine, using a scrub brush and detergent water to loosen any food particles. Be careful not to splash water inside the motor.

(4) Wipe the mixing machine dry with a clean cloth.

d. Safety precautions.

(1) Never scrape the product down in the mixing bowl when the mixer is operating.

(2) Keep your hands away from the whip or beaters when the mixer is operating.

(3) Never start the mixer when the beaters or whips are not properly attached.

(4) Keep the area around the mixer clean and dry.

(5) Never fill the mixing bowl over 3/4 full. NEVER OVERLOAD.

(6) Do not use the mixing bowl as a stock pot. Mixing bowls are for mixing only, not cooking.

(7) Use the proper whips and beaters.

(8) When changing speeds, insure the proper meshing of gears. Use the clutch when operating a mixer with a manual clutch.

(9) Be sure you attach the mixing bowl properly.

4-6. VERTICAL STEAMER

a. Description (figs 4-7 and 4-8). The vertical steamer is designed to provide well cooked, palatable foods in the shortest possible time and with a minimum loss of vitamins. Originally it was designed for vegetable cooking only, but is is equally useful in cooking hams, roasts, poultry, and seafoods. Normally, the vertical steamer is located near the steam-jacketed kettles. The vertical steamer consists of:

(1) Body. A framework with legs, used to support all parts of the steamer.

(2) Compartments. The vertical steamer may have either two or three sections separated by steamtight partitions to allow for independent operation.

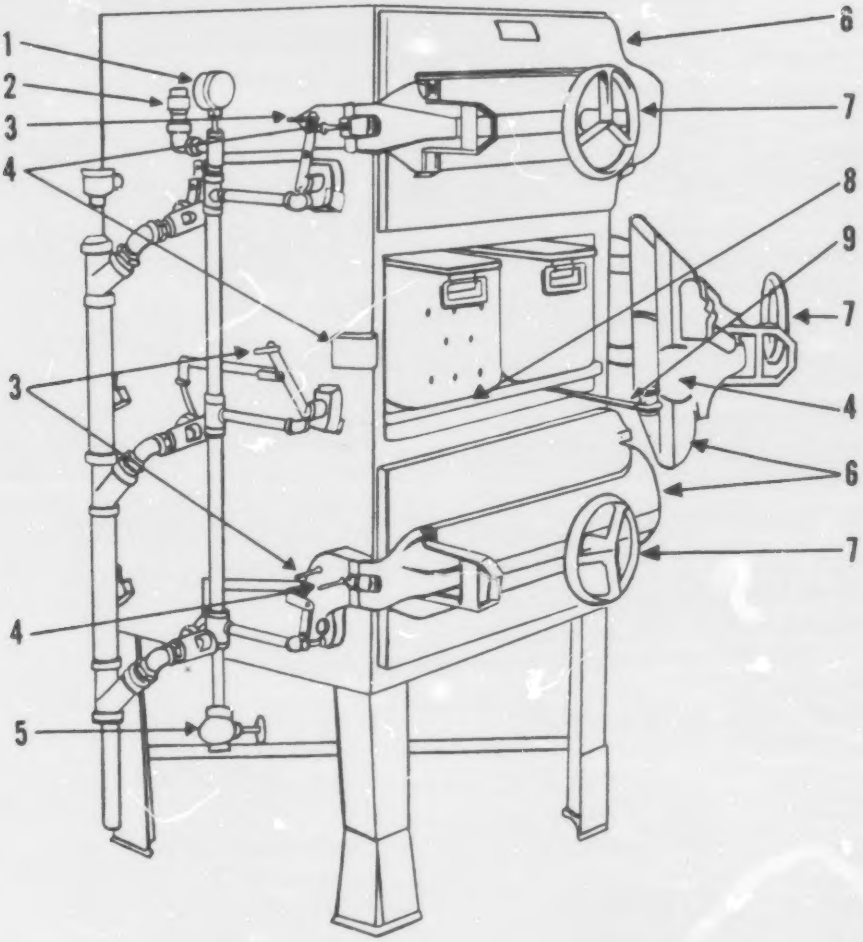
(3) Doors. The doors of the vertical steamer are made of cast metal the same shape as the compartment. They are flexibly suspended on the right front part of each compartment and have a hinged locking bar operated by a wheel-driven screw for opening and closing; others may have an eccentric locking device on the left side which works in conjunction with the steam inlet and pressure release valves.

(4) Shelves. The shelves are mounted on a steel crossbar frame fitted on slides, either stationary or attached to the door. They are the full width of the compartments and are used to hold the baskets of food.

(5) Baskets. The baskets are perforated or unperforated containers, either full width or two half widths of the compartments. They are used to hold food. Never cook foods in the perforated basket if you want to retain the juices for a sauce or gravy.

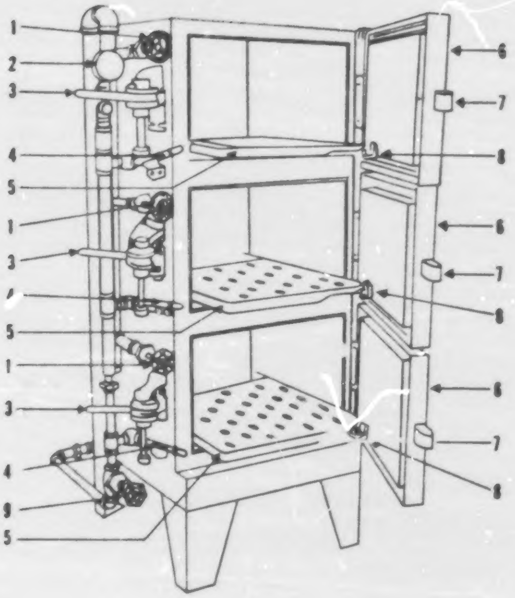
(6) Control valves. Every vertical steamer has various control valves.

(7) Steam pressure gage. The steam pressure gage is a round, metal, numerically lettered disk, having a glass face. It is used to estimate the pressure in the steam inlet valve.



1 Steam pressure gage
2 Safety valve
3 Compartment steam valve control handle
4 Door locking device
5 Main steam inlet valve
6 Compartment doors
7 Door tension wheel
8 Sliding shelf
9 Shelf linkage attachment

Fig 4-7. Vertical steamer, handwheel locking door.



1 Steam pressure relief valve
2 Steam pressure gage
3 Locking cam handle
4 Compartment steam valve, plunger
5 Sliding shelf
6 Compartment doors
7 Door locking lug
8 Shelf linkage attachment
9 Main steam inlet valve

Fig 4-8. Vertical steamer, cam-locking door.

b. Operation.

(1) Locate the compartments, doors, shelves, door locking devices, main steam valve, steam pressure gage, door tension wheels, and the steam safety valve (fig 4-7 and 4-8).

(2) Fill the baskets with the food to be cooked and slide them into the compartments.

(a) Figure 4-7 shows a full-floating, flexibly suspended door that has a handwheel to tighten the pressure screw. To place the steamer in operation, secure the latch lock on the left-hand side of the door and apply pressure to the door by turning the handwheel clockwise. Turn on the steam by bringing the compartment steam inlet valve control handle forward.

(b) Figure 4-8 shows a cam-locking door. To place this steamer in operation, close the door and engage the hasp on the door with the locking cam on the left side of the steamer. The handle of the cam should be turned to the right and pressed against the face of the door. When locking the door the steam to the compartment is automatically turned on. Close the steam pressure release valve immediately by turning the valve handle clockwise.

(3) Turn off the steam pressure. This step varies with the make of equipment.

(a) When operating the full-floating, flexibly suspended door model, the steam pressure is turned off by pushing the compartment steam valve control handle clockwise. This releases some pressure in the compartment. Then turn the handwheel back to the full length of travel. This will cause the wheel to jam on the threads. Release the latch lock on the left side of the steamer and open the door SLOWLY.

(b) When using the cam-locking door model, turn the pressure release valve counterclockwise before releasing the lock. This releases the steam pressure inside the compartment. Rotate the locking cam handle to the left; this automatically turns off the steam pressure and unlocks the door. Open the door SLOWLY.

(4) Turn off the main steam valve.

c. Disassembly and cleaning.

(1) Remove the shelves by releasing the linking rod from the door, grasp the shelf, and pull it out of the compartment.

(2) Using a scrub brush and detergent water, scrub the shelves thoroughly.

(3) Rinse by dipping the shelves into a sink containing clear, hot water.

(4) Dry the shelves with a wiping cloth.

(5) Scrub the interior of the compartments thoroughly and scrub the exterior of the steamer including the legs.

(6) Dip a wiping cloth in clear water, wring dry, and remove all traces of the detergent solution from the interior and exterior of the steamer.

(7) Use a dry wiping cloth to dry the steamer.

(8) Grasp the shelf, place it on the slide channel, and back it into the compartment. Let the shelf drop into position, pull it forward, and engage the linking rod in the door.

(9) Leave the doors of the steamer open to allow fresh air to reach the compartment.

d. Safety precautions.

(1) Always be sure the doors are tightly closed before turning on the steam.

(2) Replace the shelves correctly after cleaning the steamer.

(3) Do not attempt to open the doors with the steam pressure on.

(4) When unloading baskets of cooked food, grasp the basket by the front handle, pull it almost out of the compartment, reach in back of the basket and grasp the other handle, then remove the basket from the compartment.

(5) Use hot pads when removing baskets from the compartments.

(6) Always open the doors slowly to allow any excess steam to escape.

(7) Do not allow the steam pressure to exceed the manufacturer's recommendations.

4-7. MEAT-SLICING MACHINE

a. Description. The meat-slicing machine (fig 4-9) is used for slicing meat (hot or cold), vegetables, and cheese. It provides uniformity and speed with a minimum amount of waste. The slicer is portable and can be used in the galley on the cooks' worktable or on the serving line to slice meat portions. The meat slicer consists of:

(1) Body. The body consists of either porcelain or stainless steel and is built to hold all the necessary devices for operation.

(2) Feed carriage. The feed carriage is a chute or table designed to operate either by gravity or by a rachet mechanism for feeding the product to be sliced against the slicing knife.

(3) Slicing knife. The slicing knife is a circular knife attached to a motor-driven shaft.

(4) Sharpening device. The knife sharpener is a set of two circular sharpening stones that can be manually engaged to the edge of the circular knife.

(5) Thickness-adjusting plate. This part is used to regulate the thickness of the slice.

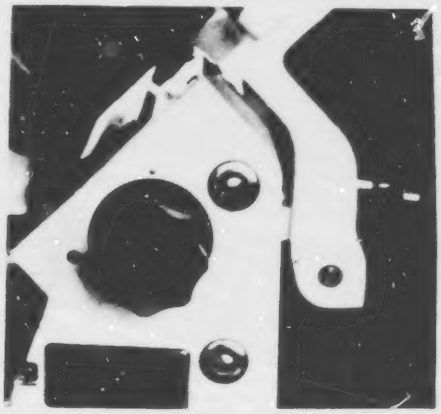
(6) Thickness adjuster. This is a graduated dial or lever used to adjust the thickness of the slice by moving the thickness-adjusting plate close to or away from the circular knife.

(7) Receiving tray. The receiving tray is used to receive the sliced product.

(8) Deflector plate. The deflector plate is used to separate the sliced product from the slicing knife.

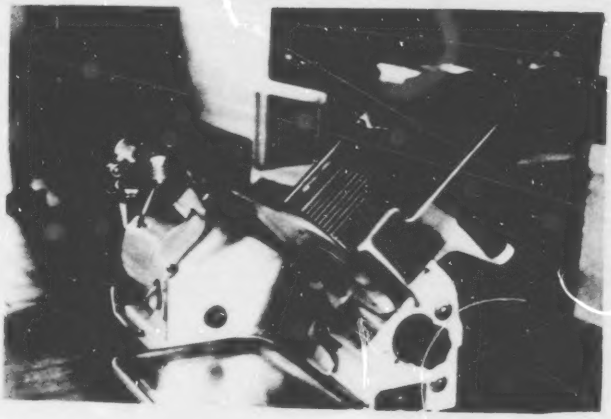
(9) Knife guard. The knife guard is a circular device which covers all exposed edges of the slicing knife.

(10) Feed grip. The feed grip is a spiked plate, used to hold and guide the product being sliced on the carriage and into the edge of the slicing knife.



Thickness adjustor.

Sharpening device.



Meat slicer.

Fig 4-9. Meat slicing machine.

b. Operation.

(1) Locate the feed carriage, feed carriage grip, end-slice plate, thickness control knob, thickness indicator scale, thickness gage plate, slicing knife, deflector plate, receiving tray, and motor switch (figs 4-10 and 4-11).

(2) Connect the electric plug with the electrical outlet.

(3) Place the food to be sliced on the feed carriage.

(4) Set the end-slice plate in position to hold and feed the meat into the slicing blade. Make sure the spiked plate is firmly grasping the product so that it will be continuously pushed against the cutting knife.

(5) Adjust the thickness control knob to slice the desired thickness.

(6) Start the machine.

(7) Slice the meat. Using the feed carriage grip (10, fig 4-10), push the carriage toward the revolving knife. On some models there may be an end-slice plate grip. In either case, when pushing the carriage toward the blade with the hands, use the handle or grip provided. DO NOT HOLD THE ITEM BEING SLICED WITH YOUR HANDS.

(8) To stop the slicer, push the switch to the OFF position and disconnect the wall plug from the electrical outlet.

c. Sharpening the cutting knife.

(1) Locate the sharpening attachment, thickness gage plate, thickness control knob, and thickness-indicating scale (fig 4-10).

(2) Set the thickness gage plate by setting the thickness control knob to "O" on the indicator.

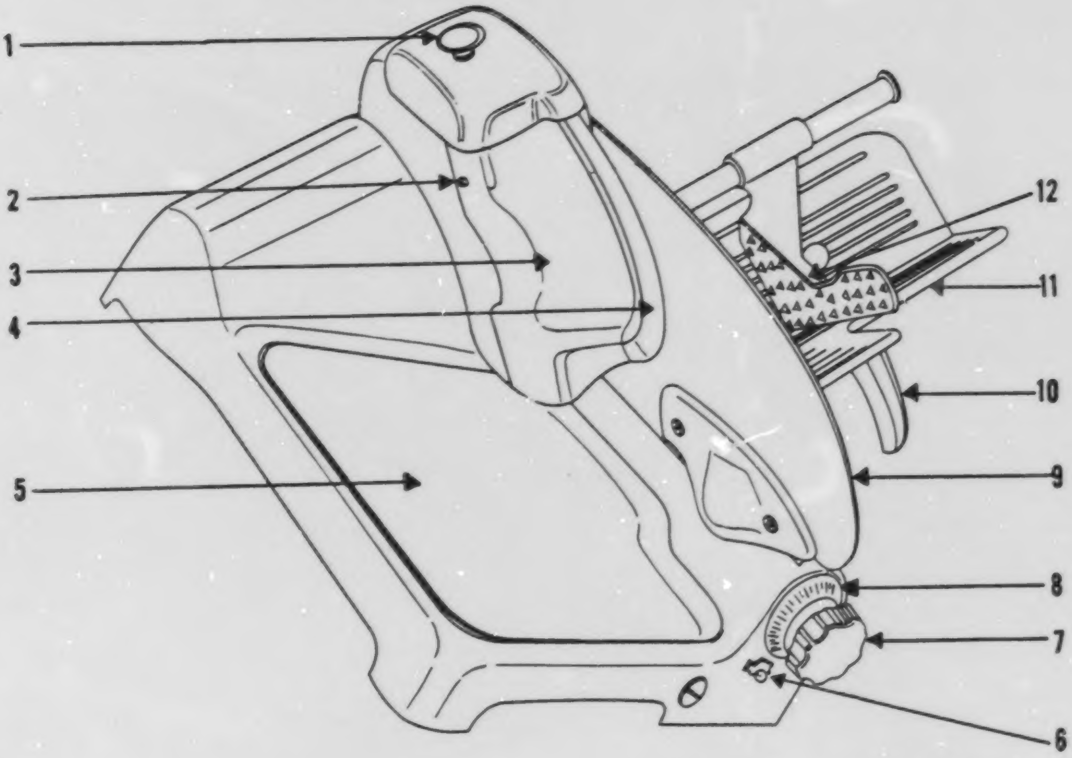
(3) Clean all food particles and grease off the cutting knife. To do this hold the wiping cloth against the cutting knife at the center, turn on the motor, bring the cloth forward to the edge of the cutting knife, removing any accumulated grease or food. Repeat this operation on the other side of the knife. Shut off the motor.

(4) Lift the sharpening attachment up over the slicing knife, turn it 1/2 turn, and lower the sharpening stones to the knife blade. On some models the sharpening stones will automatically come in contact with the blade at this point. On other models this must be done manually by engaging the sharpening stones with the aid of two levers, one lever for each stone.

(5) Start the motor and hold the sharpening stones in contact with the revolving knife approximately 4 to 10 seconds. Release contact by either raising the attachment or releasing the levers. Shut off the motor and unplug the electric plug.

(6) Lift the sharpening attachment up, turn it 1/2 turn back, and lower it into the attachment housing.

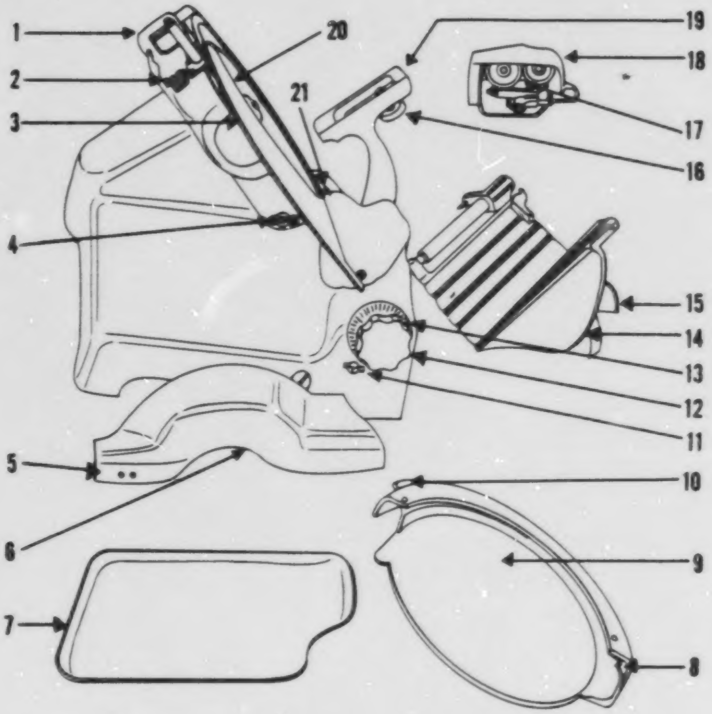
(7) Clean the slicing knife by repeating step (3) above.



Legend

1 Sharpening attachment
2 Slice deflector pins
3 Slice deflector
4 Cutting knife
5 Receiving tray
6 Motor switch
7 Thickness control knob
8 Thickness-indicating scale
9 Thickness gage plate
10 Feed carriage grip
11 Feed carriage
12 End-slice plate

Fig 4-10. Meat-slicing machine, gravity feed, assembled.



Legend

1 Sharpening attachment housing
2 Slice deflector pins
3 Thickness gage plate
4 Slice deflector plate lock
5 Slice deflector pin holes
6 Slice deflector
7 Receiving tray
8 Knife guard bottom pin recess
9 Knife guard
10 Knife guard locking lever
11 Motor switch
12 Thickness control knob
13 Thickness indicator scale
14 Feed carriage
15 End-slice plate
16 Feed carriage locking pin
17 Sharpening wheels
18 Sharpening attachment
19 Feed carriage support
20 Cutting knife
21 Knife guard bottom pin

Fig 4-11. Meat-slicing machine, gravity feed, disassembled.

d. Disassembly and cleaning. The various means of disassembling the meat and vegetable slicer parts differ according to the manufacturer's design. The disassembly steps as stated here are general. The manufacturer's instructions should be followed for the type and design machine you are using.

(1) Remove the electric plug from the receptacle.

(2) Set the thickness gage plate to "O."

(3) Turn the feed carriage locking nut counterclockwise to loosen the feed carriage from the feed carriage support.

(4) Lift the left side of the receiving tray up and slide it out to the left.

(5) To remove the slice deflector, grasp the deflector at the bottom and pull slightly forward, removing the deflector from the pins holding it in place.

(6) To remove the knife guard, pull the latch on top of the guard up. Turn the guard lock 2 or 3 inches and lift the guard off of the knife guard pin.

(7) Place the sharpener over the slicing blade.

Note: This is a safety precaution to protect your hands from the cutting edge of the circular knife.

(8) Prepare a pan of detergent water. Wash the stationary parts of the slicer using a wiping cloth saturated with the cleaning solution, removing all grease and food particles from the slicer. Caution: Be careful to prevent the cloth from contacting the knife edge; also watch your fingers to prevent cuts from the slicing knife.

(9) Use another wiping cloth to rinse all traces of detergent from the slicer.

(10) Wipe the slicer dry, being careful not to cut your hands.

(11) Wash the disassembled slicer parts in the pot sink and run them through the dishwashing machine.

e. Safety precautions.

(1) Never use the slicer when the knife guard is detached.

(2) Keep your hands dry when using the slicer.

(3) Keep your hands away from the revolving knife.

(4) Never push food against the knife with your hands; use the feed grip.

(5) Remove the electric plug from the receptacle immediately after using the slicer.

(6) To avoid severe cuts on the hands, never use a rubbing or scrubbing motion when cleaning the slicer. Use a careful wiping motion away from the edge of the blade.

(7) Do not try to force frozen items through the slicer and do not attempt to slice meats containing bones.

(8) Do not attempt to remove the knife from the sharpener.

(9) When cleaning, do not allow water to enter the motor.

(10) Hold the left hand under the blade on the receiving side and let the slices fall into your hand. Do not attempt to pull the slices through and do not touch the knife. The slices will fall when they are severed.

(11) Do not carry the slicer from one area to another without assistance.

(12) Never engage in horseplay or hold conversations when operating this piece of equipment. The meat and vegetable slicer is a source of serious injuries, many of which have been caused by not paying attention to the task at hand.

(13) Using the meat and vegetable slicer is a simple operation. The entire machine is constructed of sturdy material that can withstand years of hard wear and tear. Use the slicer with care, follow all the safety precautions, clean and sharpen the knife according to directions, and the failure of the slicer will be kept to a minimum. In case of any mechanical or electrical trouble, immediately notify the chief cook.

4-8. AUTOMATIC VEGETABLE CUTTER AND SLICER

a. Description. The automatic vegetable cutter and slicer has many uses in the dining facility. It can do bias slicing, horizontal slicing, strip cutting, dicing, and rough or fine chopping.

(1) The automatic vegetable cutter and slicer is constructed of a cast aluminum body, using a slicer disk and cutting head that cuts food fed through four different entries into various strips and thicknesses.

(2) The slicing-adjustment knob (8, fig 4-12) is located on the right-hand side of the unit. It can be set to any thickness from 0 to 1/4 inch.

(3) The cutting head is a complete assembly consisting of rotary cutting blades and guide plates.

(4) The vegetable cutter is turned on by means of a snap-on switch which has a red reflector light. The red light will turn on when the switch is on and the motor is in operation.

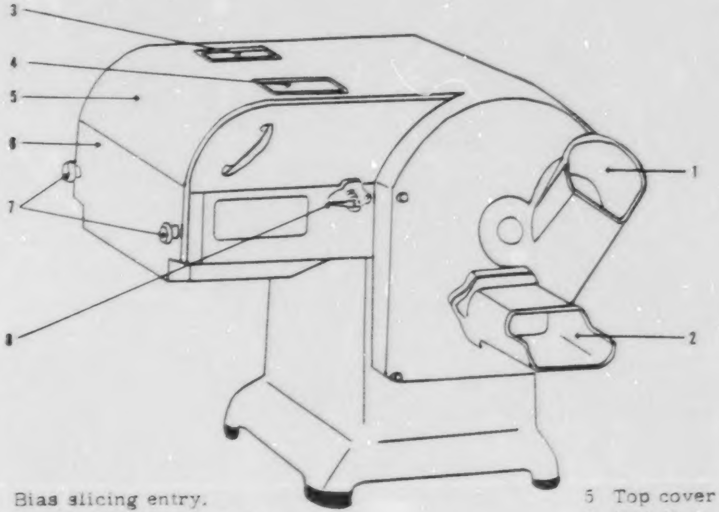
(5) The vegetable cutter also has a safety switch which works in conjunction with the hinged top. The safety switch turns off the machine when the top is raised.

(6) Other equipment needed to operate the automatic vegetable cutter are:

(a) Stompers, one for each entry.

(b) French knife, to cut the product to fit the entry holes.

(7) The automatic vegetable cutter and slicer is a finely machined piece of equipment, and through careful handling will perform many cutting tasks quickly and safely. If properly used and cared for, it will operate with a minimum amount of maintenance. Always completely clean out the machine after using, disassembling when all the cutting has been accomplished, rinsing after each operation, and oiling the various parts daily as indicated by the manufacturer. If the unit begins to knock while in operation, check the wing nut on the cutting head as this nut tends to work loose.



1 Bias slicing entry.
2 Horizontal slicing entry.
3 7/16 strip cutting entry.
4 3/16 strip cutting entry.
5 Top cover
6 End plate
7 Knurled knobs
8 Slicing adjustment

Fig 4-12. Vegetable cutting and slicing machine.

b. Operation. The procedures for each type of cutting or slicing are basically the same. They may vary slightly due to manufacturer's design.

(1) General information: Refer to figure 4-12.

(2) Suggested procedures:

(a) Slaws. Set the thickness of the slicer to 1/16", use entry #1 (bias cutting), and push one piece on top of the other, using the stomper on the last piece.

(b) American fries. Set thickness of slicer to 3/16" and feed through entry #1 (bias cutting).

(c) Potato chips. Set thickness of slicer to 1/64" and feed through entry #1 (bias cutting).

(d) Cucumbers. Set thickness of slicer to 1/16" and feed through entry #1 (bias cutting).

(e) Chopped lettuce or cabbage. Quarter the vegetable with a french knife and feed it into entry #3 (7/16" strip cutting and rough chopping). Use the stomper. This procedure gives you a neatly chopped product in a matter of seconds. If you desire a finer chopping, use the same procedure but feed the vegetable into entry #4 (3/16" strip cutting and fine chopping).

(f) Radishes. Set the slicer to 1/32" and pour radishes into entry #1 (bias cutting). Use the stomper with slight pressure.

(g) Apples, pears, and pineapples. These fruits can be sent through the slicer in any desired thickness, but here is a suggestion: put these fruits through entry #4 (3/16" strip cutting and fine chopping). The result is a neat, different ingredient for your fruit and vegetable salads.

(h) Beets. Slice to any thickness on entry #1, also cut into julienne strips by using entry #4.

(i) Parsley. Using entry #4, fill the hopper. Use the stomper to complete the operation. If a finer chop is desired, feed the parsley through a second time.

(j) Onions, chopped. Use entry #4.

(k) Onions, sliced. Set the slicer adjustment to the thickness desired. Place two onions into entry #1 and use the stomper to feed the onions into the machine.

(l) Chopped eggs. To process hard-cooked eggs for egg salad, fill entry #4 full and use the stomper to feed the eggs through.

(3) Slicing fruits and vegetables horizontally.

(a) Bring the product to be cut, an empty pan, and a french knife to the machine.

(b) Place the empty pan under entry #2 to receive the finished product.

(c) Use the french knife and cut the product to fit entry #2.

(d) Set the thickness gage to the desired thickness.

(e) Fill entry #2 with the product.

(f) Turn on the electricity.

(g) Use the stomper designed for entry #2 to push the product through the entry. The slices will fall into the empty pan.

(h) After the desired amount has been sliced, turn off the snap switch and "flush rinse" the machine.

(4) As the operator of the automatic vegetable cutter and slicer you will find that the above mentioned procedures are simple and at the same time you may find other methods and uses through further experience.

c. Disassembly and cleaning.

(1) Disassembly.

(a) Assemble your tools. To disassemble the cutter and slicer you will need a screwdriver to loosen the nut on the cutting head and a wrench to loosen the nut holding the slicer disk.

(b) Turn off the electric switch and remove the plug from the receptacle.

(c) Raise the top cover by unlatching the catch located in front of the slicer. Grasping the handle, raise the hinged cover.

(d) Remove the front plate by unscrewing the four knurled knobs and pulling the front plate forward.

(e) Fit the wrench firmly and securely on the hexagon half-nut and loosen it by turning it counterclockwise. Unscrew the hexagon knife off the stud.

(f) Remove the adjusting armguard by unscrewing the knurled knob and lifting the adjusting armguard out.

(g) Remove the slicer disk by unscrewing the knurled knob holding the disk. Pull the disk forward out of the socket.

(h) Remove the end plate by unscrewing the two knurled knobs located on the left side of the base. Pull the end plate forward to remove it.

(i) Remove the cutting head by unscrewing the wing nut on top of the cutting head and slide it out. Caution: Handle the cutting head with care to keep from damaging it. Do not disassemble the knives which are attached to the cutting head.

(2) Cleaning.

(a) Assemble your cleaning supplies and prepare a detergent solution.

(b) Wash the entire interior and exterior of the machine by dipping a clean cloth into the detergent water and wringing it partly dry. Wipe off the entire area, removing any food particles.

(c) Rinse the machine. Rinse the cleaning cloth with hot clear running water, wring partly dry, and wash off all traces of the detergent.

(d) Wring out the cloth and wipe the machine dry.

(e) Place the disassembled parts in the pot sink gently to avoid bumping one against the other.

(f) Wash the disassembled parts carefully, using a scrub brush and a wire pick to remove any particles of food that may have become wedged in crevices or in between the cutting knives.

(g) After washing, rinse the disassembled parts in hot water to rinse off all traces of detergent.

(h) Air-dry the parts.

(i) After each 30 days of daily use, a mechanic should disassemble the cutting knives. The base that holds these knives can be thoroughly cleaned at that time.

(3) Flush rinsing.

(a) When you are finished processing a product and intend to use the machine for other preparation, you can "flush rinse" instead of a complete disassembly and washing procedure. Place an empty pan under the exit hole. Fill a gallon pitcher 3/4 full of hot water and, while the machine is in motion, pour the water through the entry you used, flushing out any food particles that may have been stuck on the cutting machine.

(b) After flush rinsing, remove and empty the pan you placed under the entry chute.

d. Safety precautions.

(1) Always disconnect the electric plug from the receptacle when the machine is not in use or when cleaning the machine.

(2) Use the proper stomper for the entry hole intended.

(3) Use extreme care in handling the rotary cutter blades and the cutting head knife when cleaning to avoid severe cuts on fingers and hands.

(4) Be sure the wing nut on top of the cutting head is replaced tightly when reassembling after cleaning.

(5) Be sure the flat side of the slicer knife is to the front when reassembling the slicer after cleaning.

(6) Be sure all the knurled knobs are tightened when reassembling the machine.

(7) Never force food into the entry holes with your hands. Use the stompers.

(8) Never force hard or frozen items into the machine.

(9) Always inspect the machine prior to operation to insure that all the parts are properly in place and working.

4-9. RANGES

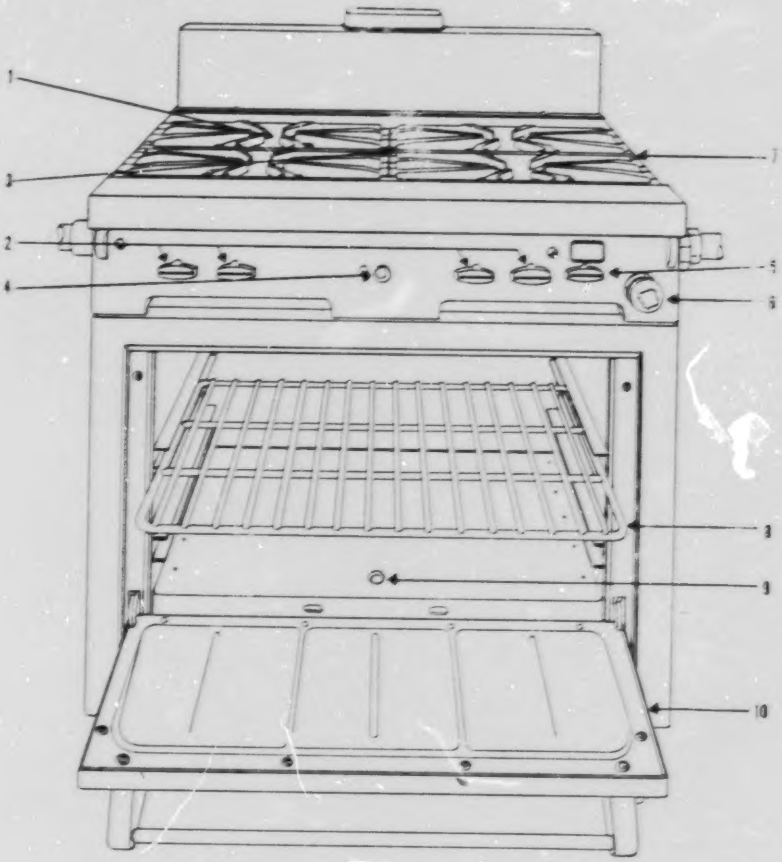
a. Description. Ranges are used to cook, roast, and bake foods and liquids by an efficient method of heat control (fig 4-13).

(1) Construction. Ranges are constructed of a sheet-iron body with a cast-iron top.

(2) Sources of heat. Gas or electricity.

(3) Controls. All ranges have controls for the type of fuel used.

(a) Gas. Controlled by gas cocks; some models have thermostats which are used in conjunction with the gas cocks.



1 Gas burner
2 Gas burner valves
3 Pilot burner
4 Pilot burner button
5 Oven burner valve
6 Thermostat
7 Open-top grates
8 Oven shelf
9 Oven lighting porthole
10 Oven door

Fig 4-13. Open-top gas-fired range.

(b) Electric. Controlled by a graduated electrical switch; some models have thermostats (fig 4-14) as well as switches.

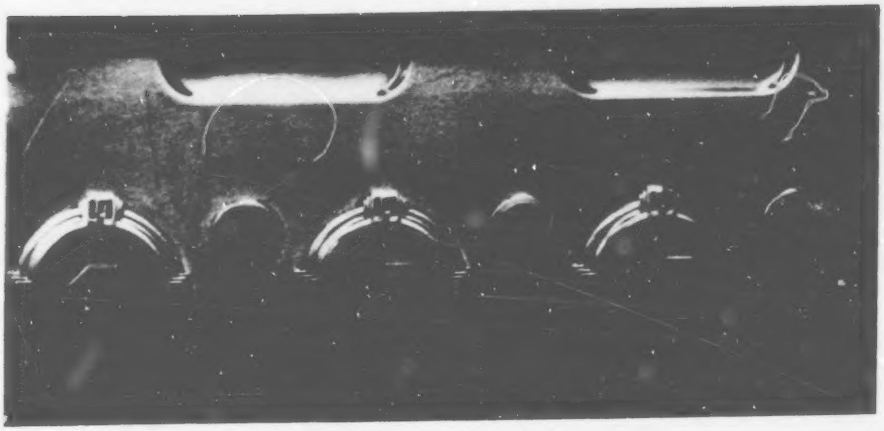


Fig 4-14. Thermostat control.

b. Operation.

(1) Gas.

(a) Locate the burners, pilot light, pilot valve, and gas valve.

(b) Be sure all the gas valves to the burners are in the OFF position.

(c) Check the gas supply. If necessary, open the gas valve on the gas line.

(d) Light the pilot light by lighting the match, turning on the pilot gas valve, and igniting the pilot light.

(e) Ignite the burner. Turn only one gas valve to the ON position. Open the gas valves to the other burners one at a time to avoid gas accumulation which may cause an explosion.

(f) Regulate the burners for the desired amount of heat by partly closing the gas valve on each burner.

(g) When completely through cooking, turn off all the gas valves.

(2) Electric (fig 4-15).

(a) Locate the heating switches and thermostats.

(b) Preheat. Turn the heating switches to low heat for 1 minute, then to medium heat for 1 minute, then turn them to high.

(c) Regulate the heat by setting the thermostat to the desired temperature.

(d) When completely through cooking, turn the switches and thermostats to the OFF position.

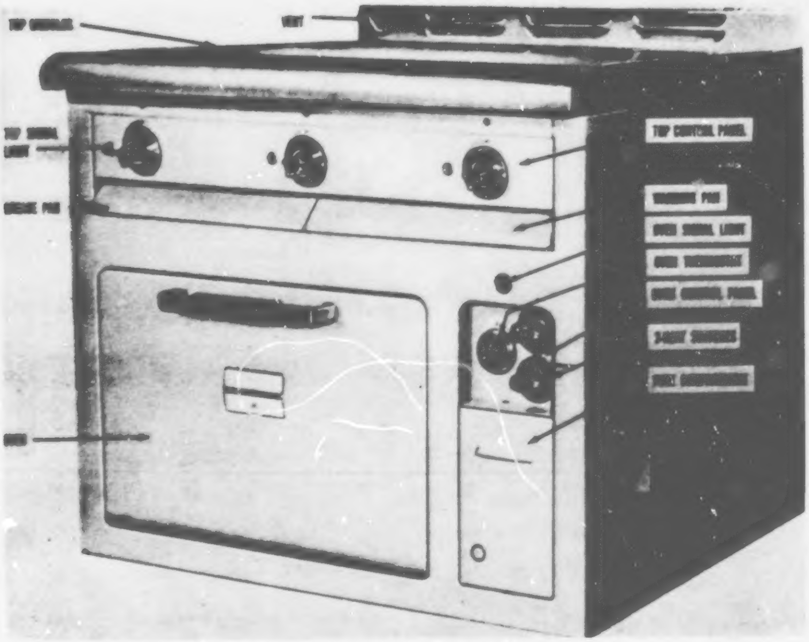


Fig 4-15. Electric-operated range.

c. Disassembly and cleaning.

(1) Gas range.

(a) Turn off all sources of heat and let the range cool. Never attempt to clean a hot range, because cleaning solutions may warp or crack the castings and may also create a safety hazard with the possibility of burning your hands and arms.

(b) Assemble your cleaning materials.

(c) Prepare a cleaning solution of 1 ounce of detergent for each gallon of hot water.

(d) Scrub the entire range with a scrub brush dipped in the cleaning solution. Use a grill stone to remove carbonized food particles.

(e) Rinse the entire range by wiping with a cloth dipped in clear water. Rinse the cloth out several times during the wiping process. Wipe the entire range dry of any excess water.

(2) Electric range.

(a) Locate the electrical switches.

(b) Assemble your cleaning supplies and detergent water solution.

(c) Make certain all electrical switches are on the OFF position. Allow the range to cool.

(d) Wash the interior and exterior of the range and oven.

(e) Rinse the interior and exterior of the range and oven using the method described for cleaning the gas range. Be sure to keep water away from any electrical elements or connections.

(f) After rinsing the interior of the oven, turn on the oven heating to low heat, leaving the door open for 5 minutes to thoroughly dry the interior. When the interior of the oven is dry, turn off the heating.

d. Safety precautions for gas or electric ranges.

(1) Keep your hands and arms away from all open flames.

(2) Avoid the boiling over of food.

(3) Always be sure the oven pilot light is lighted and the burner is burning before closing the oven door.

(4) Always make sure the burners are burning under the griddle of solid-top model gas ranges.

(5) Avoid splashing hot foods when moving filled pots on top of the range.

(6) Always use a hot pad or cloth when handling pots and pans.

(7) Do not permit excessive grease to accumulate in the grease disposal trough.

4-10. ELECTRIC GRIDDLE

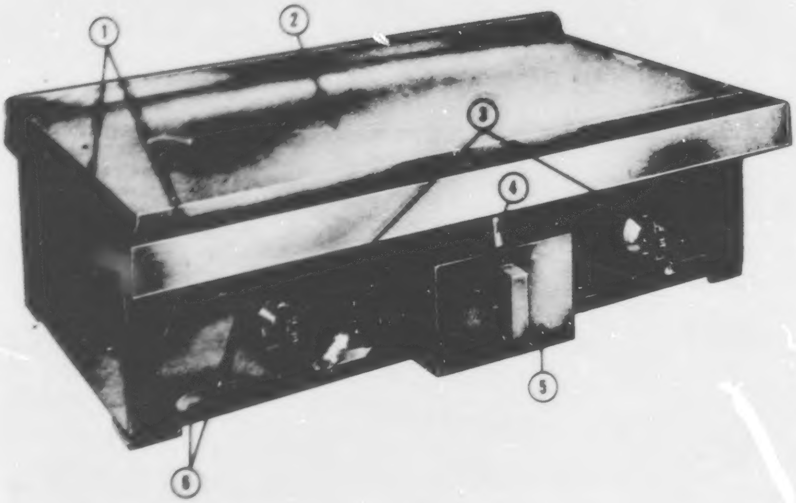
a. Description. The griddle is used to fry foods that require cooking in little or no fat. The griddle can be used for cooking meat, fish, poultry, eggs, certain vegetables, and batter products. It generally is located on the serving line. The electric griddle consists of:

(1) Griddle plate. A piece of cast metal which is machine-polished and used to hold the food while cooking.

(2) Grease trough. A trough located directly below the griddle plate either on three or four sides, used to receive excess grease from the griddle plate and acts as a drain to transfer the grease to the grease receptacle.

(3) Grease receptacle. A boxlike container with a handle, located in front of the griddle under the grease trough drain. Used to catch and hold the grease flowing from the grease trough.

(4) Temperature controls. Electric controls containing thermostats on the front panel of the griddle (fig 4-16).



1 Grease trough
2 Griddle plate
3 3-heat switches
4 Grease drip
5 Grease receptacle
6 Front panel

Fig 4-16. Electrically heated griddle.

b. Operation.

(1) Locate the grease receptacle and electric controls.

(2) Check and be sure all electric controls are shut OFF.

(3) Preheat the griddle by turning the electric control to LOW for about 3 minutes.

(4) Regulate the heat to the frying temperature required.

(5) Cook the product as directed by the recipe card.

(6) Turn off the electric control and allow the griddle to cool.

c. Disassembly and cleaning.

(1) Assemble your cleaning supplies.

(2) Prepare a detergent solution.

(3) Scrape the griddle plate while it is still warm, using a griddle stone on the entire surface to remove all food particles and residue.

(4) Remove all residue and scrapings into the grease receptacle.

(5) Cover the entire surface of the griddle plate with used fat.

(6) Press the griddle stone against the griddle plate and, by pushing back and forth vigorously, scour the entire surface of the griddle plate until it is bright and clean.

(7) Use a wiping cloth to wipe the griddle plate free of grease.

(8) Using one corner of the wiping cloth, force it through the hole in the grease trough to remove all traces of food particles and grease.

(9) Remove the grease receptacle and empty it into a garbage can. Wash the grease receptacle in the pot sink.

(10) Wash the entire surface of the griddle plate, the top edges, sides, grease trough, and all exterior surfaces of the electric griddle, using a scrub brush dipped in the cleaning solution.

(11) Use a wet cloth to remove all traces of detergent and wipe dry.

(12) Replace the cleaned grease receptacle.

d. Safety precautions.

(1) Always preheat the griddle at low temperature before setting at the cooking temperature.

(2) Do not allow the grease receptacle to overflow.

(3) Do not pour water on the hot griddle plate.

(4) Keep water away from all electrical connections while cleaning.

(5) Remove the electric plug from the electric receptacle when cleaning and when the griddle is not in use.

4-11. ROASTING OVENS

a. Description. The cooking or roasting oven is designed specifically to cook foods by roasting or baking under sanitary conditions and by regulated heat temperatures. This type of oven is also referred to as a sectional or stack oven. It is either gas or electrically operated and consists of:

(1) Gas (fig 4-17).

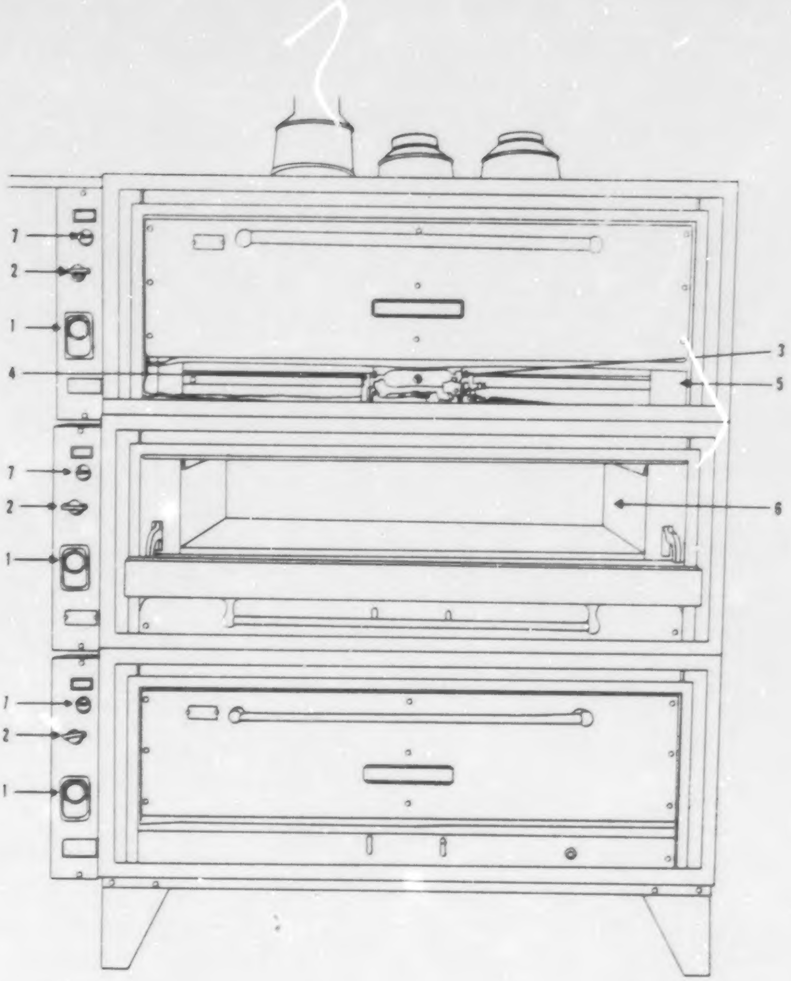
(a) Heating unit.

(b) Pilot light.

(c) Burners.

(d) Thermostats.

(e) Oven.



1 Thermostat	5 Burner compartment
2 Gas burner valve	6 Oven compartment
3 Pilot light	7 Pilot light gas valve
4 Gas burner	

Fig 4-17. Gas-fired roasting oven.

(2) Electric (fig 4-18).

(a) Signal light which indicates when the oven is ON or OFF.

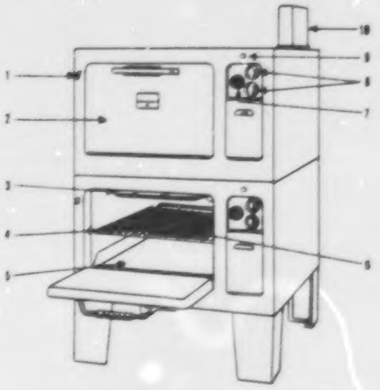
(b) Heat control switches.

(c) Thermostats.

(d) Oven.

(e) Dampers which control moisture in the oven.

The sectional oven has one oven section placed above the other with each section having a self-contained heating unit and thermostat. It can be used as a combination for roasting or baking. The capacity depends on the dimension of the oven, the containers used, and the types of food. Some dining facilities have large, rotating ovens that may contain 18-20 roasting pans at one time.



1 Damper control lever
2 Oven door
3 Top heating unit
4 Oven shelf guide rail
5 Bottom heating unit
6 Oven shelf
7 Thermostat
8 Heat control switches
9 Signal light
10 Oven vent

Fig 4-18. Electrically heated roasting oven.

b. Operation.

(1) Gas.

(a) Locate the thermostat, gas valve, oven burner, and pilot light.

(b) Open the oven door to clear any accumulated gas. (This is a safety precaution.)

(c) Open the burner compartment door, ignite a match and hold the flame to the pilot burner while turning the thermostat control dial to approximately 250° F. Open the gas valve to the ON position. The pilot burner and oven burner should ignite simultaneously. Be sure they are both completely ignited. Close the burner compartment door.

(d) Set thermostat to the temperature required. Allow oven to preheat for 20 minutes. Load the ovens with the pans of items to be cooked.

(e) When the items are cooked, remove them from the oven and turn the gas valve to OFF position. Leave the doors open to let the oven cool for cleaning.

(2) Electric.

(a) Locate the heat control switches, thermostats, signal light, and damper control.

(b) Set the top and bottom heat control switches to high. Turn the thermostat dial clockwise to the desired temperature. The signal light will flash on indicating that the oven is preheating and it will go off when the desired temperature is reached.

(c) Regulate the top and bottom heat. If the item to be cooked requires different top and bottom heat, regulate by turning the top or bottom switches to the degree of heat required, either the low, medium, or high setting.

(d) Open the oven doors and load the oven evenly.

(e) If steam escapes during cooking through the oven doors, open the oven vent by pulling out the damper control lever.

(f) Remove the finished product and turn all controls to the OFF position. Leave the oven doors open to let the oven cool.

c. Cleaning the oven.

(1) Assemble your cleaning supplies.

(2) Prepare a detergent solution.

(3) Brush or scrape the interior of the oven using either a wire brush or a dry scrub brush.

(4) Wash the interior with a cloth dampened with the cleaning solution. Wipe the interior, starting with the walls and then the deck of the oven. Use a minimum amount of water.

(5) Use a scrub brush and scrub the inside and outside of the oven doors.

(6) Wipe the entire oven with a cloth dipped in clean hot water to remove all traces of detergent.

(7) Wipe dry with a clean cloth.

(8) Leave the oven doors open to air-dry the interior of the oven completely.

d. Safety precautions.

(1) Never close the oven doors until you are sure the gas is ignited.

(2) Wipe out spilled grease from the oven immediately, as this creates a fire hazard.

(3) Before lighting the gas-operated oven, open the oven door to allow any accumulated gas fumes to escape.

(4) Never wash the oven while it is still hot as this will cause the shelving or deck to warp.

(5) Never slam the doors as it may extinguish the flame on the gas-operated ovens.

4-12. DEEP-FAT FRYERS (fig 4-19)

a. Description. The deep-fat fryer is used for frying such foods as meat, fish, poultry, certain vegetables, and pastry products by submerging them in hot fat. The deep-fat fryer consists of:

(1) Fat container. Used for holding the hot fat. The bottom is sloped toward the center and equipped with a drain.

(2) Wire fry baskets. Used to hold the food to be lowered into the hot fat. They are made either full size or 1/2 the size of the fat container.

(3) Heating unit. A tubular coil placed in the bottom of the fat container or along the sides of the fat container and heated by electricity.

(4) Heat control. The temperature of the fat is controlled by a thermostat.

(5) Drain valve. On large models the drain valve is normally located on the bottom of the fat container. It is used to drain liquified fat from the fat container.

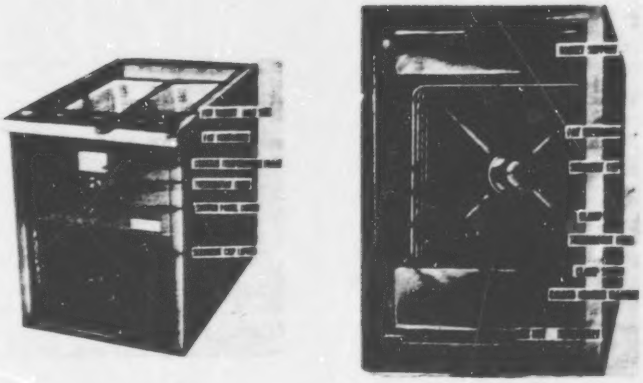


Fig 4-19. Deep-fat fryer (two views).

b. Operation.

(1) Locate the fat container (fig 4-19), wire baskets, heating unit, thermostat, and the drain valve.

(2) Determine the amount of fat needed for your particular type of fryer.

(3) Premelt the solidified fat by placing the fat into a suitable container. Place it on the range and melt it or place the solidified fat into a steam-jacketed kettle and melt it. Do not use the deep-fat fryer to melt the fat. This creates a fire hazard. The electric coils must be covered with liquid fat when they are hot. When they are not submerged they will cause the fat to ignite and burn.

(4) Check the drain valve to be sure the drain is closed and put the sediment cup in place.

(5) Pour the melted fat into the fat container.

(6) Turn on the electricity and adjust the thermostat to the desired temperature.

(7) Place the ingredients to be fried in the wire fry baskets.

(a) Cover the bottom of the basket with uniform-sized products.

(b) Do not overload the basket.

(c) Shake off all excess crumbs from all breaded items and shake off excess water from such items as french-fried potatoes.

(8) Lower the basket gently into the fat compartment to avoid causing the hot fat to boil over.

(9) Fry the product as long as required by the recipe card, raising the fry basket occasionally to check if done.

(10) Raise the basket out of the hot fat and hook the end over the basket supports and allow the fat to drain.

(11) When you have completely finished the frying operation, turn off the heat control and reset the thermostat to zero.

c. Draining the deep-fat fryer.

(1) Assemble two containers to catch and store the hot fat and a grease filter or filter bag.

(2) Allow the hot fat to cool to 250° F.

(3) Place the filter securely over one container.

(4) Remove the fry baskets, sediment cup, and wire screen from the deep fryer and wash them in the pot sink.

(5) Place the other container directly under the drain valve.

(6) Open the drain valve slowly to avoid splashing of hot fat. If sediment clogs the drain valve, use a long piece of wire to loosen it.

(7) Fill the container only 3/4 full to avoid spilling when you remove the container of hot fat from the deep fryer.

(8) Turn off the drain valve and remove the container of hot fat. Be careful not to spill or splash the hot fat on your hands or feet. The best method for preventing this type of accident is to have someone help you whenever you must carry the hot fat container.

(9) Using a ladle, transfer the hot fat from the first container to the filter bag. Filtered fat will then drain into the second container.

(10) Finish draining the deep-fat fryer. Repeat steps (5) through (9) until all the fat has been drained from the fryer.

(11) Repour some of the fat into the top of the deep-fat fryer to wash the loose sediment from the sides and bottom of the fat container.

(12) Deposit the sediment in a garbage can.

(13) Remove the filter bag or grease filter from the top of the container of filtered fat and place it under a faucet of hot running water to remove all traces of sediment. Then wash the filter in hot detergent water, rinse, and air-dry.

(14) Store the filtered grease in the refrigerator.

d. Cleaning the deep-fat fryer.

(1) Assemble your cleaning supplies.

(2) Check to be sure the drain valve is closed.

(3) Fill the fat container to within 2 inches of the top with water.

(4) Add approximately 1 ounce of detergent to each gallon of water used. Mix it will. Note: Do not use lye or caustic soda.

(5) Turn on the heat control and set the thermostat to 250° F.

(6) Allow this solution to "boil" for 20 minutes.

(7) Turn off the heat and set the thermostat to zero.

(8) Using a long-handled brush, scrub the entire interior of the fat container.

(9) Place a container directly under the drain valve and drain off the solution.

(10) Remove the container from beneath the drain faucet, dip a brush in the solution, and scrub the entire outside of the deep-fat fryer including the base.

(11) Close the drain valve and refill the fat container with clear water. Rinse the interior of the fat container and drain off the rinse water.

(12) Wipe the entire deep-fat fryer dry.

e. Safety precautions.

(1) Do not overfill the deep-fat fryer with fat. Follow the manufacturer's instructions.

(2) Always check the drain valve to make sure it is shut before filling the deep fryer.

(3) Make sure the cleaning solution has been completely rinsed out of the fat container.

(4) Never heat fat to the smoking point.

(5) Keep the heating coils covered with liquid fat while using the deep fryer.

(6) Always get help when carrying containers of hot fat.

4-13. COFFEE URNS

a. Description. The coffee urn is used to brew fresh coffee under strict sanitary conditions in a standard manner. The coffee urn may be either centrally located in the galley or placed near the serving line. The coffee urn may consist of a 3-battery urn (fig 4-20), a twin urn (fig 4-21), or a single urn (fig 4-22), that heats the water for brewing coffee and stores brewed coffee. The three types of coffee urns may be either gas-heated, steam-heated, or electrically-heated (fig 4-20) and may be either gravity-fed or siphon-fed. The combined unit also contains heating elements, faucets, and gages. (Faucets, bag, and metal basket are shown separately in figure 4-23.)

(1) 3-battery urn (fig 4-20). The 3-battery urn consists of:

(a) Stainless steel lid or cover. This is equipped with a handle and fits on top of the urn.

(b) Inner liner. This is made of stainless steel and is used to hold brewed coffee.

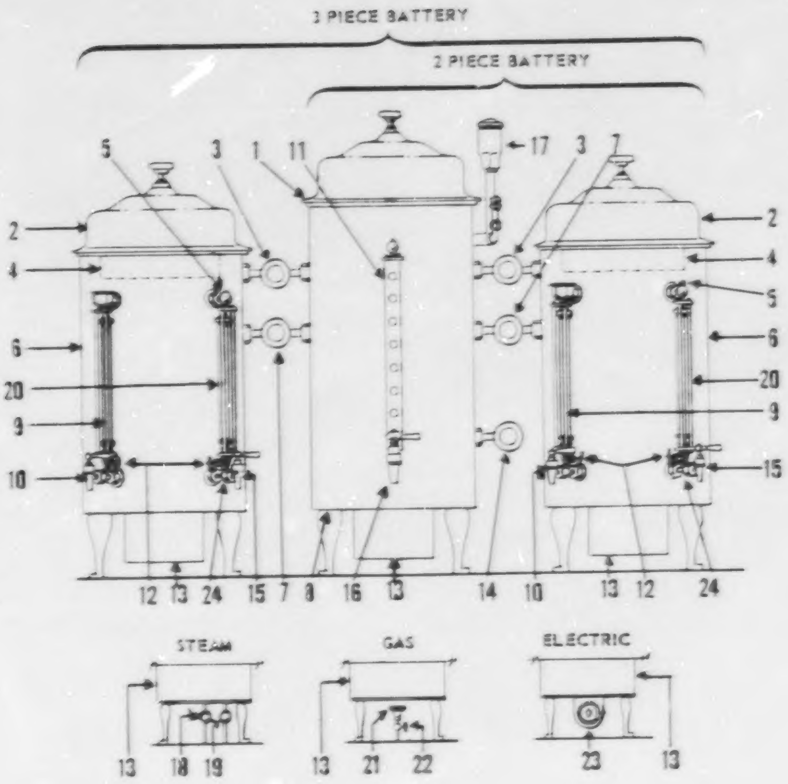
(c) Outer jacket. Made of stainless steel, this is the outer part or frame of the coffee urn.

(d) Coffee gage. A long glass tube set in brackets on either side of the urn; it is equipped with a spigot. The gage is protected by a metal strip with either openings or graduations to indicate, in gallons, how much coffee is in the urn.

(e) Water gage. Identical in construction as the coffee gage; however, it indicates the amount of water in the water jacket.

(f) Coffee faucet. Attached and fits through the lower part of the outer jacket into the inner liner. Used to drain off coffee.

(g) Water urn or boiler. The 3-battery urn consists of two urns for making and storing brewed coffee and one urn located in the center as a water urn or boiler used to boil and hold water to be used in brewing coffee.


3 PIECE BATTERY
2 PIECE BATTERY
5
3
1
11
17
3
7
2
4
6
20
9
10
2
4
5
6
20
9
15
12
13
24
15
7
8
16
13
14
10
13
12
24
STEAM
GAS
ELECTRIC
13
18
19
13
21
22
23
13

1 Water urn lid
2 Coffee urn lid
3 Water siphon valve for brewing coffee
4 Reservoir for coffee bag or metal basket
5 Gage, glass cleanout cap
6 Coffee urn
7 Water jacket siphon valve
8 Water urn or boiler
9 Water jacket gage
10 Water jacket faucet
11 Water urn or boiler gage
12 Gage glass petcock

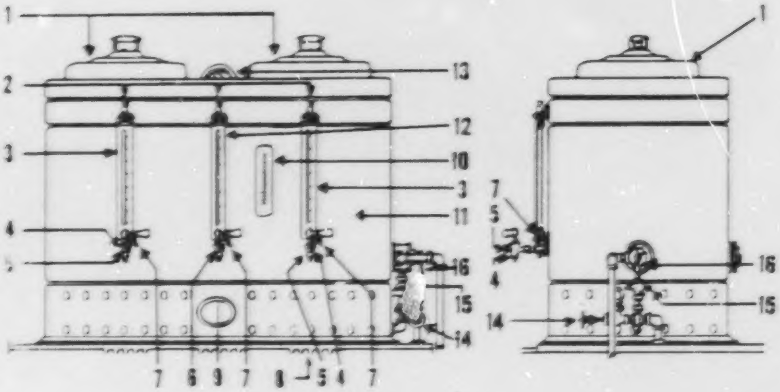
13 Heating units
14 Water inlet valve
15 Coffee faucet
16 Water urn or boiler faucet
17 Safety valve
18 Steam inlet valve
19 Steam outlet valve
20 Coffee gage glass
21 Gas burner
22 Gas burner valve
23 Electrical heat control (switch)
24 Coffee faucet union nut

Fig 4-20. Coffee urn battery.

(2) Twin and single urns.

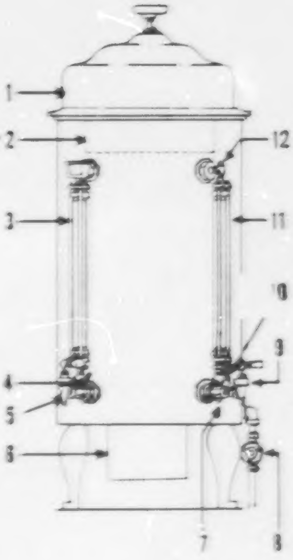
(a) Both the twin-unit coffee urn (fig 4-21) and the single-unit coffee urn (fig 4-22) are so constructed that the water being held for heating is stored around the inner lining encased by the outer jacket rather than in a separate water urn.

(b) The water urn or boiler consists of the lid, the body of the urn, water gage, and the water faucet.



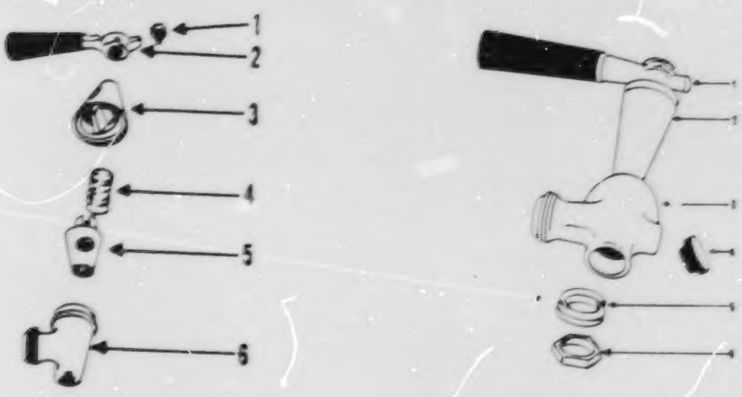
1	Urn lids
2	Gage, glass cleanout caps
3	Coffee gage, glass
4	Coffee faucet
5	Coffee faucet cleanout cap
6	Hot-water faucet
7	Gage, glass petcock
8	Drain trough
9	Lighting porthole (gas)
10	Thermometer
11	Urn body
12	Water gage glass
13	Vent hole and cover
14	Water inlet valve
15	Gas burner valve
16	Thermostat

Fig 4-21. Coffee urn twin unit, front and side views.



1	Urn lid
2	Reservoir for coffee bag or metal basket
3	Water jacket gage
4	Water gage, glass petcock
5	Hot-water faucet
6	Heating unit (gas, steam, or electric)
7	Coffee faucet union nut
8	Water inlet valve
9	Coffee faucet
10	Coffee gage, glass petcock
11	Coffee gage, glass
12	Coffee gage, glass, cleanout cap

Fig 4-22. Coffee urn, single unit.

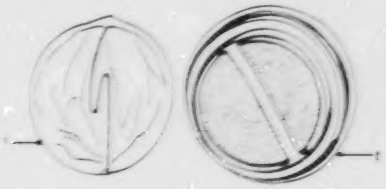


1 Handle bolt
2 Handle
3 Cap
4 Tension spring
5 Stem
6 Body

Coffee urn faucet
(Special type)

1 Handle
2 Stem
3 Body
4 Cleanout cap
5 Tension spring
6 Locknut

Coffee urn faucet
(Regular type)



1 Urn bag and ring
2 Metal basket

Fig 4-28. Coffee urn faucets, bag, and metal basket.

b. Operation.

(1) Locate the water urn, water inlet valve, water gage, water jacket siphon valve, heating unit, coffee bag and ring, metal basket and filter paper, coffee faucet, lids, and the thermometers if the urn is equipped with them.

(2) Open the water inlet valve and fill the water urn until the water level in the gage is at "O." Close the water inlet valve.

(3) Open the water jacket siphon valve and fill the water jacket until the water level in the jacket gage is 2 inches from the top. Close the water jacket siphon valve.

(4) Determine what type of heating unit is on your coffee urn and turn it on, as follows:

(a) Gas. Be sure there is no accumulation of gas fumes under the urn. Light the match, open the gas valve slowly, and light the burner.

(b) Steam. Open the steam inlet valves.

(c) Electric. Turn the electrical heat control switch to high position.

(5) Rinse the urn by drawing 1 gallon of hot water from the water urn, pour the hot water into the inner liner of the coffee urn and distribute the water thoroughly. Open the coffee faucet and drain off the rinse water completely; close the coffee faucet.

(6) Assemble the equipment needed to make the coffee, i.e. coffee grounds, coffee bag and ring or metal basket and filter paper, and a 1-gallon measure.

(7) Assemble the coffee bag onto the metal ring or place the filter paper into the metal basket.

(a) Coffee bag and ring. Insert open end of bag ring into the opening in the seam of the bag and thread the bag on the ring by pushing the ring completely through the seam. Be sure to overlap the seam past the opening of the ring. Wet the coffee bag thoroughly with cold water.

(b) Metal basket. Remove the lid from the top of the basket; place the filter paper evenly on the perforated bottom of the basket.

(8) Place the bag or basket on the rim of the coffee urn reservoir.

(9) Pour the measured coffee into the coffee bag or basket.

(10) Replace the lid.

(11) Check the temperature of the water. On urns equipped with a thermometer the temperature should be 212° F. On urns not so equipped, steam should be escaping through the safety valve.

(12) Pour water over the coffee grounds.

(a) Siphon method. Lift the lid over the coffee urn and turn the siphon arm to a position where the spray nozzle is centered over the coffee grounds. Replace the lid. Note the water level in gallons on the water urn gage; open the siphon valve completely. Replace the amount of water used in brewing by refilling the water urn to the original level in gallons.

(b) Manual pour method. Grasp the gallon measure with your right hand and place it under the water faucet, open the faucet, and draw off 1 gallon of water. Raise the lid of the coffee urn and pour the drawn water over the coffee grounds in a circular sweeping motion to evenly distribute the water. Repeat this operation until the required amount of water has been poured over the grounds.

(13) Refill the water urn and adjust the heat to maintain the brewed coffee at 185° to 190° F, which is the proper serving temperature.

(14) When the coffee has completely drained from the coffee bag, remove the bag and empty the grounds into the inedible garbage container. Thoroughly rinse the bag in hot, clear running water. Under no circumstances use soap or a detergent to wash the coffee bag. The coffee bag should be placed in a pan of cold water until future use. An urn bag which has been allowed to air-dry will turn sour.

c. Disassembly and cleaning.

(1) Cleaning the inner lines and gage glass.

(a) Assemble your cleaning supplies.

(b) Place 1 gallon of boiling water and 1 package of urn cleaner into the urn.

(c) Clean the inner liner by scrubbing thoroughly, dipping the urn brush into the solution and brushing all the inside parts.

(d) Remove the gage glass cleanout cap at the top of the gage glass fitting, then place a gage glass brush in the opening and push it all the way to the bottom, working it up and down four or five times to clean the glass thoroughly. Remove the brush.

(e) Place a gallon measure under the gage glass petcock, remove the screw cap from petcock and place the gage glass brush in the opening immediately. Turn the petcock to the open position to allow the brush to pass through. Push the brush back and forth four or five times, allowing as little solution as possible to escape, remove the brush, close the petcock, and replace the nut.

(2) Cleaning the faucets.

(a) Drain the cleaning solution into a 1-gallon measure and save it.

(b) Disassemble the petcock by removing the bolt or nut on the small tapered end of the valve stem. Remove the washer and pull out the valve stem. Scrub them thoroughly in the urn-cleaning solution, removing all traces of dried coffee deposits.

(c) Disassemble the "regular" faucet (fig 4-23) by removing the nut under the valve stem. Remove the spring and washer and pull the valve stem out through the top of the faucet body. Scrub these parts thoroughly to remove dried coffee deposits.

(d) Disassemble the "special" type faucet (fig 4-23) by removing the screw or bolt on top of the faucet handle, remove the handle, and unscrew the packing nut by turning it counterclockwise. Lift off the nut, spring, and washer and remove the valve stem by lifting it from the faucet body. Clean these parts thoroughly to remove all dried coffee deposits.

(3) Rinsing the inner liner, gage glass, and faucets.

(a) Plug the coffee faucet and the petcock connecting tube with a piece of clean cloth.

(b) Pour 1 gallon of hot water into the inner liner.

(c) Rinse the liner by dipping the urn brush into the clear water and rinsing the interior thoroughly.

(d) Clean the petcock connecting tube by removing the cloth plug and inserting a gage glass brush and moving it back and forth to rinse thoroughly.

(e) Remove both plugs and drain the inner liner.

(f) Rinse the gage glass by pouring hot water carefully through the opening at the top of the gage glass. Use the gage glass brush again if necessary.

(g) Rinse the faucets and petcock thoroughly under running hot water.

(h) Assemble the faucets and petcock.

(4) Neutralizing rinse.

(a) Make a neutralizing solution by dissolving 2 ounces of baking soda in 1 gallon of hot water.

(b) Rinse the urn by pouring the solution into the inner liner and drain it through the pet-cock and faucet. Repeat and drain it through two or three times; discard the solution.

(c) Rinse the urn with clear hot water two or three times.

(d) Dampen a cloth with clear hot water and wipe the exterior of the urn and urn stand, rinsing out the cloth often.

(e) Wash and store all cleaning equipment.

d. Safety precautions.

(1) Check all the water, steam, and heating connections prior to using.

(2) Use extreme care in pouring hot water over the grounds to avoid spilling boiling water or coffee on any part of your body.

(3) Always use a solid stand to stand on when pouring hot water into the top of the urn.

(4) When refilling the water jacket or water urn, stay near the urn to prevent water from overflowing.

(5) Never let the water urn or water jackets run dry. If this does occur, shut off all sources of heat and allow the urn to cool before refilling.

(6) Check the safety valve frequently to be sure it is in working order.

4-14. MEAT TENDERIZER

a. Description. The meat tenderizer is used to make tough meat tender by breaking down the fibers in the meat. The meat tenderizer (figs 4-24 and 4-25) consists of:

(1) A stainless steel body with a baked enamel finish. It is used to house all parts of the machine.

(2) A motor located in the lower part of the machine, rubber-mounted, and protected with a metal cover to keep meat particles from entering the working parts.

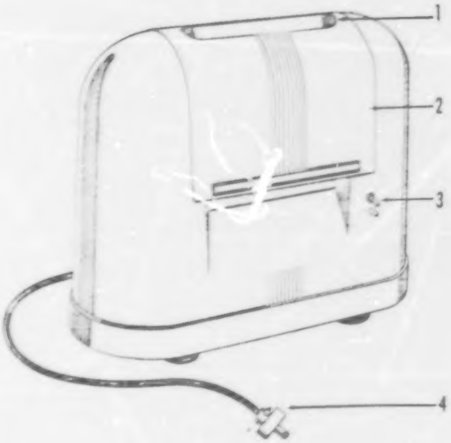
(3) Tenderizing parts.

(a) Knives and rollers. The knives are disk-shaped with bent cutting edges. They are attached to a roller which is set on a shaft (fig 4-26).

(b) Spacers. The spacers are disk-shaped pieces of metal placed between each knife to act as dividers of the knives.

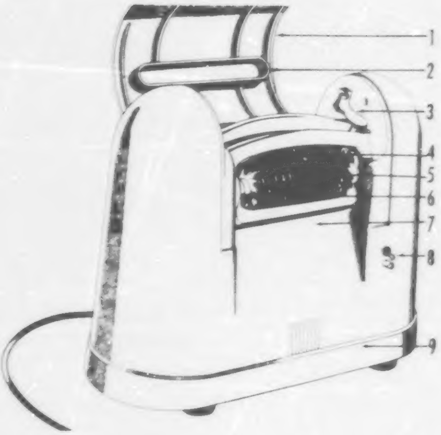
(c) Cleaning combs. The cleaning combs are comb-shaped stainless steel teeth that guide the meat between the knives (fig 4-26).

(4) Switch. An ON-OFF switch is located on the side of the meat tenderizer. There is also a safety switch located inside the tenderizer which automatically shuts off the tenderizer when the protective cover is raised.



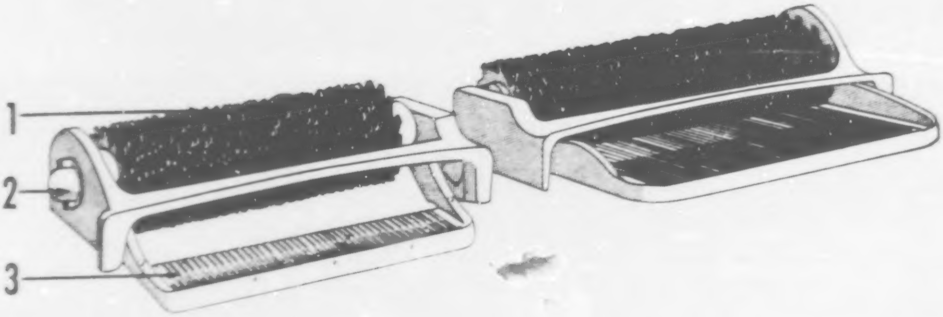
1 Feeder slot
2 Body
3 Switch
4 Cord and plug

Fig 4-24. Meat tenderizer, protective cover closed.



1 Protective cover
2 Feeder slot
3 Latch
4 Comb
5 Knives
6 Roller and shaft
7 Chute
8 Switch
9 Body
10 Plug and cord

Fig 4-25. Meat tenderizer, protective cover open.



1 Knives
2 Roller and shaft
3 Combs

Fig 4-26. Meat tenderizer cutting knives.

b. Operation.

(1) Locate the feeder slot, chute, switch, and tenderizer parts. Inspect the machine to make sure it is properly assembled.

(2) Place a pan directly under the chute.

(3) Place the meat to be tenderized into the feeder slot. Do not force the meat into the machine. Place it into the machine slowly or as fast as the machine will take it.

(4) As the meat falls from the chute grasp it in the hand and stack it in a pan. (For a more tender steak, turn the meat a quarter turn and run it through the tenderizer a second time.)

c. Disassembly and cleaning.

(1) Disconnect the electric plug from the electrical receptacle.

(2) Raise the protective cover.

(3) Remove the tenderizing parts by turning the bearing knobs to the left and lifting up and out.

(4) Take the tenderizing parts to the pot sink and scrub them thoroughly to remove all meat particles. They should be run through the dishwashing machine after washing in the pot sink.

(5) Prepare a detergent solution, dip a clean cloth in the solution, and wipe the tenderizer housing clean.

(6) Rinse the tenderizer housing with a clean cloth and clean water. Wipe dry.

(7) Place all the tenderizing parts on a drainboard to air dry.

d. Safety precautions.

(1) Do not place your hands into the feeder slot while the machine is operating.

(2) Be sure the machine switch is in the OFF position and the electric plug is disconnected before disassembling or cleaning.

4-15. FOOD CUTTER AND VEGETABLE SLICER

a. Description. The food cutter and vegetable slicer is a combination vegetable preparation machine. It is different in design and operation from the automatic vegetable cutter and slicer (fig 4-12); however, the resulting products are similar. Your dining facility may be equipped with either or both of these food cutting machines.

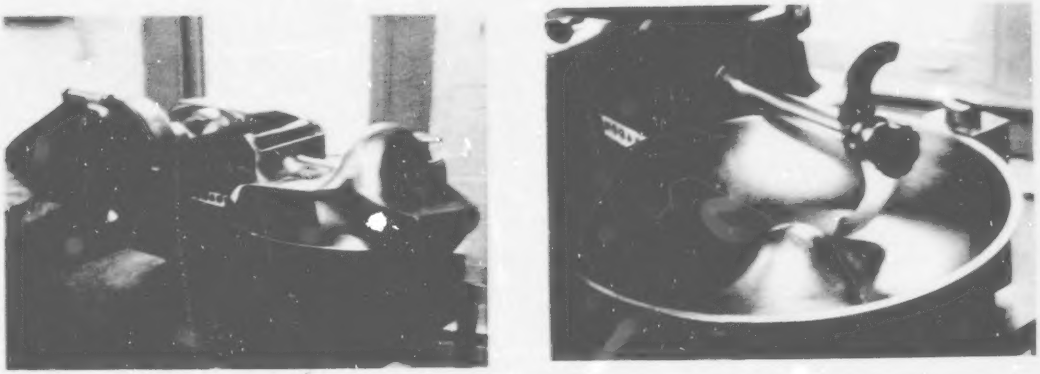
(1) The food cutter and slicer will chop vegetables to a coarse or fine consistency, slice vegetables, chop or slice nuts, and make coarse or fine bread or cracker crumbs.

(2) The food cutter consists of a large revolving stainless steel bowl which rotates slowly and a pair of curved knives made of cutlery stainless steel which are held on a shaft and revolve rapidly at over 3,000 revolutions per minute (fig 4-27).

(3) The cover is stainless steel and carefully fitted to the bowl. It can be raised to remove food from the bowl or for cleaning.

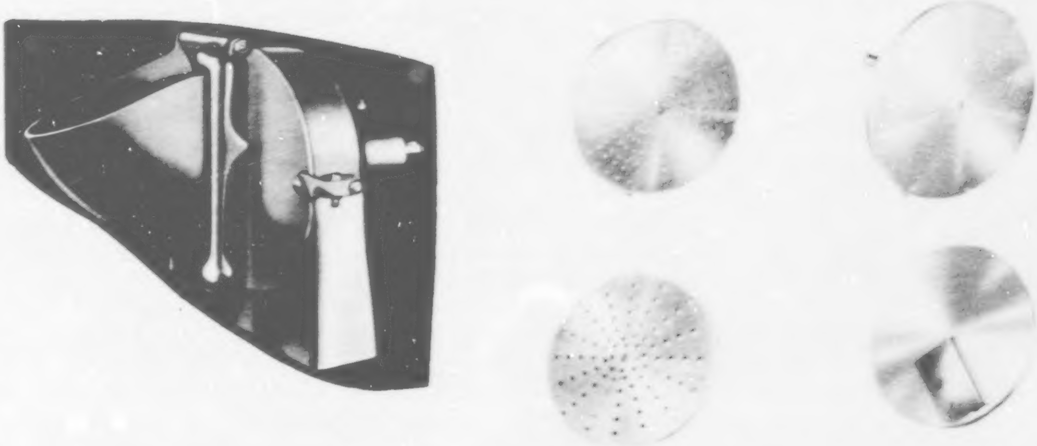
(4) A safety switch works in conjunction with the cover. When the cover is raised, the switch shuts off the electric current, stopping the machine. The machine will not operate unless the cover is locked down.

(5) The vegetable slicer fits into the attachment hub located on the left side of the machine. The vegetable slicer grates, slices, juliennes, and cuts french fries, according to the various attachments used.



Food cutter and vegetable slicer

Food cutter bowl



Vegetable slicer attachment

Grating, shredding, and slicing plates

Fig 4-27. Food cutter and vegetable slicer.

b. Operation.

(1) Vegetable cutter.

(a) Make sure the machine is properly assembled and the safety cover is in place.

(b) Turn on the switch.

(c) As the bowl rotates, drop the vegetables to be chopped into the bowl. Do NOT put your hands into the bowl. The rotating bowl will carry the food to the spinning knives.

(d) The degree of fineness desired is determined by the length of time you allow the food to remain in the bowl. After the food is sufficiently chopped, turn off the electric switch and disconnect the plug from the receptacle.

(e) When the bowl stops rotating, raise the safety cover and empty the bowl. Do NOT attempt to empty the cutting bowl while it is rotating. The few seconds it takes to turn off the machine and remove the food properly is worth less than the chance of losing your fingers to the spinning knives.

(2) Vegetable slicer.

(a) Slide the shaft of the slicer attachment (fig 4-27) into the attachment hub of the machine and lock it in place by tightening the thumbscrew.

(b) Insert the slicer plate (fig 4-27) you want to use into the front of the hopper.

(c) Attach the front of the hopper to the slicer body, and close the latch.

(d) Turn on the electric switch.

(e) Raise stomper plate and insert the item to be sliced into the hopper and feed it into the knife blade using the stomper plate. Do not force the items into the blade.

c. Disassembly and cleaning.

(1) Food chopper.

(a) Turn off the electric switch and disconnect the plug at the receptacle.

(b) Raise and remove the safety cover.

(c) Remove the knurled knob from the drive shaft.

(d) Slide off the curved knives being very careful to avoid cuts.

(e) Grasp the cutter bowl and turn it 1/4 turn counterclockwise, raise and remove it.

(2) Vegetable slicer. The entire vegetable slicer attachment can be removed from the machine by loosening the thumbscrew on the attachment hub and pulling the slicer attachment forward. Both the vegetable slicer parts and the food cutter bowl, knives, and cover can be washed at the pot sink and run through the mechanical dishwashing machine. The main body of the food cutter and vegetable slicer can be cleaned as follows.

(a) Prepare a hot detergent solution.

(b) Scrub the entire machine with a stiff brush dipped into the detergent solution.

(c) Rinse the machine by dipping a clean wiping cloth into clear hot water and wiping away all traces of detergent.

(d) Wipe the machine dry with a clean wiping cloth.

d. Safety precautions.

(1) Do NOT permit water to get on the electric motor or connections.

(2) Be sure the machine is off and the electric plug is disconnected before cleaning the machine.

(3) Do not reach into the revolving bowl.

(4) Do not attempt to cut frozen objects.

(5) Be sure the bowl cover is locked down before turning on the electricity.

(6) Be sure the machine is properly assembled before use.

4-16. MECHANICAL CAN OPENER (fig 4-28)

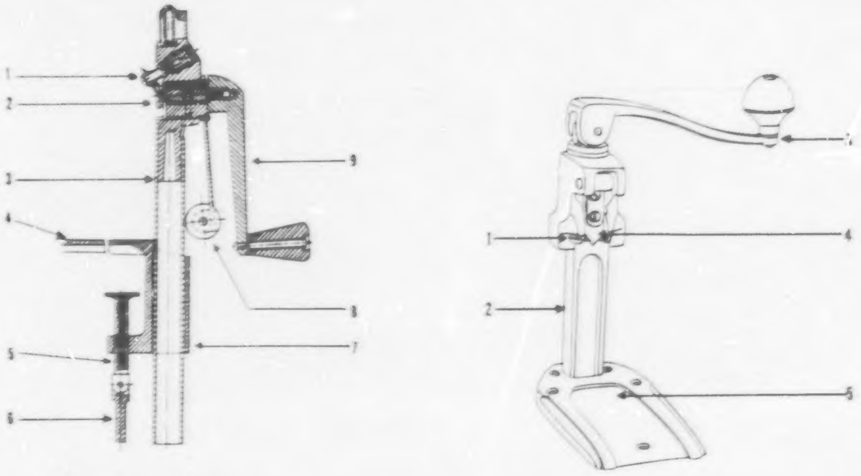
a. Description. The mechanical-type can opener is used to cut or open any can regardless of the bead. It can be securely fastened to a sturdy table conveniently located in the galley for easy flow of work. Mechanical bench-type can openers will vary slightly in style and operation according to the manufacturer's design. They basically consist of:

(1) The base, which is an oblong solid piece of metal designed to extend over the edge of the table with an opening for a vertical shaft. The base has a swivel clamp screw for clamping to a table temporarily and it has three holes for inserting screws to fasten the base to a table permanently.

(2) The vertical shaft is a metal column made to fit the opening in the base. The upper part consists of the cutting parts and crank handle.

(3) The cutting parts consist of either a cutting wheel and traction wheel or a pointed, sharp blade and traction wheel.

(4) The crank handle is a solid piece of metal with a knob on the end for turning. It is swivel-mounted on the vertical shaft.



1 Cutting wheel
2 Traction wheel
3 Shaft
4 Base
5 Clamp screw
6 Clamp screw swivel handle
7 Shaft housing
8 Eccentric lever handle
9 Crank handle

Style A

1 Traction wheel
2 Shaft
3 Crank handle
4 Cutting knife
5 Base

Style B

Fig 4-28. Mechanical can openers.

b. Operation. Mechanical can openers are operated in the following manner:

(1) Clamp the can opener base securely to a work table and insert the vertical shaft into the opening in the base.

(2) Raise the vertical shaft 2 inches above the height of the can to be opened. On some models the vertical lever may be locked in this position to aid in opening a large quantity of cans.

(3) Set the can on the base close to the vertical shaft.

(4) The can opening process will vary at this point according to the type of opener you use.

(a) Type A.

1. Lower the vertical shaft until the cutting parts engage the rim of the can.

2. Grasp the eccentric lever, turn it clockwise until it is resting on the opposite side of the vertical shaft.

3. Grasp the crank handle by the knob and turn it clockwise until the lid of the can is completely cut out.

4. Return the eccentric lever to its original position, raise the vertical shaft, and remove the opened can from the base.

5. Lower the vertical shaft.

(b) Type B.

1. Set the can so that its top rim rests firmly against the traction wheel.

2. Raise the crank handle to a vertical position and, with a quick downward motion, force the cutting knife through the top of the can.

3. Lower the crank handle to a horizontal position and turn the crank handle clockwise until the lid of the can is completely cut out.

4. Lift the crank handle and raise the vertical shaft, releasing the can from the cutting knife.

5. Remove the opened can from the base and lower the vertical shaft down into the base.

c. Cleaning.

(1) Remove the vertical shaft from the can opener base.

(2) Remove the base from the table.

(3) Take the can opener and its base to the pot sink and scrub them thoroughly, making sure you remove any metal shavings or food particles that may have collected around the cutting knife, cutting wheel, or traction wheel. Rinse the can opener by holding it under running hot water to allow the hot water to flush away any detergent or food particles, then allow it to air-dry.

d. Safety precautions.

(1) Make sure the can is braced firmly against the opener shaft or traction wheel before depressing the cutting edge into the can.

(2) Make sure the base of the opener is secured tightly to the table.

(3) Use care in removing the lids of opened cans to prevent cuts.

4-17. SERVING LINE

The serving line is used to display foods and keep them hot or cold for short periods of time. The two main components of a serving line consist of a steam table and a refrigerated serving line. The steam table is used to maintain hot foods at the proper serving temperatures during the meal period (140°-150° F). The refrigerated serving line maintains cold foods at their proper serving temperature. Remember, in chapter 2 we pointed out the HOT foods are to be served HOT and COLD foods served COLD.

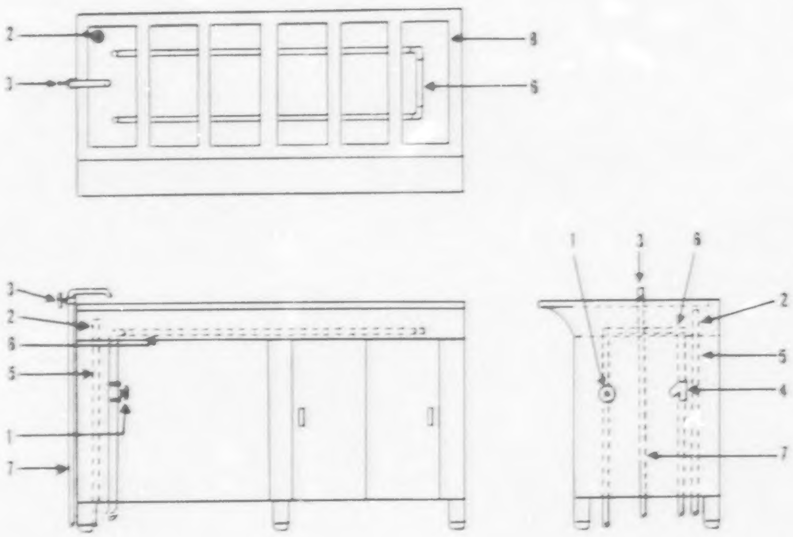
a. Steam table (fig 4-29). The steam table is used to keep foods hot while they are being served.

(1) Description. The steam table consists of:

(a) A stainless steel rectangular compartment that holds hot water. The top of it contains openings of specific sizes to fit food inserts. The openings may be round, oblong, or a combination of both.

(b) The overflow pipe is a hollow metal tube that fits into the drain of the water compartment.

(c) The steam table may be heated either by steam, gas, or electricity. The steam-heated system consists of hollow metal coils placed in the bottom of the compartment. The gas-heated system may have burners located under the water compartment. The electric-heated system is heated by electric elements located under or inside the water comparment.



1 Steam inlet valve
2 Overflow pipe
3 Water faucet
4 Steam trap
5 Water drain
6 Steam coil
7 Water pipe
8 Insert opening

Fig 4-29. Steam operated serving line.

(2) Operation.

(a) Locate the drain inside the water compartment and fit the overflow pipe into it.

(b) Turn on the water faucet and fill the water compartment full enough to cover 1 inch of the bottom of the steam line inserts.

(c) Turn on the heating unit and adjust the control to maintain the proper temperature.

(d) Place the food inserts into the compartments.

1. Fill the inserts to only 3/4 capacity.

2. Hold the insert firmly with both hands using a hotpad if necessary.

3. Lower the insert gently into the compartment.

4. Do not place foods into the steam table earlier than 15 minutes before serving. Always keep the food covered before serving and during any extended breaks in serving.

(3) Disassembly and cleaning.

(a) Turn off the heating unit.

(b) Remove the food inserts, using a hotpad to prevent burning your hands.

(c) Drain the water compartment by removing the overflow pipe.

(d) Prepare a detergent solution.

(e) Using a rubber spatula or a similar device, scrape off any food that may have spilled on the steam line. Use care not to damage any heating elements or scratch the stainless steel surface.

(f) Scrub the interior of the water compartment thoroughly with a stiff brush and the detergent solution, particularly around and under the heating coils and the underside of the top surface of the water compartment.

(g) Clean the exterior by wiping with a cloth saturated with the detergent solution.

(h) Rinse the interior and exterior by wiping with a clean cloth and clear water, removing all traces of detergent, then wipe dry.

(4) Safety precautions.

(a) Inspect all the joints, connections, and heating units for leaks before each use.

(b) Do not turn on the heating unit before the compartment is partly filled with water.

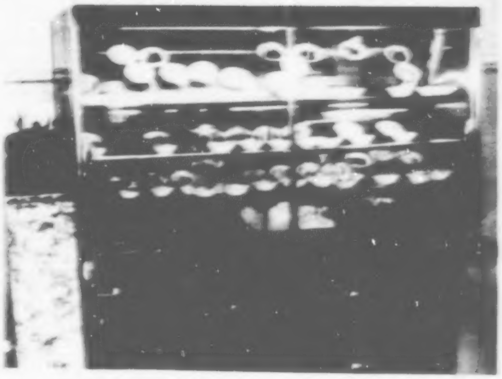
(c) Place the food inserts gently into the compartment; never drop them.

(d) Keep the area around the steam table clean and dry to prevent falls.

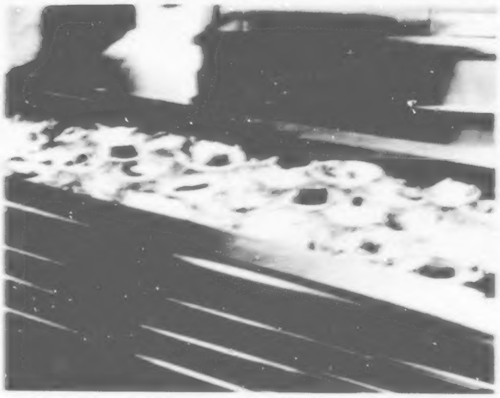
(e) Always use an overflow pipe to prevent water from overflowing the steam table. Never use a drain pipe.

b. Refrigerated serving line.

(1) Description. The refrigerated serving line is normally used for serving fresh fruits, juices, and fresh salads which must be kept chilled during the serving period. The design of the refrigerated serving line will vary according to its location and the type installed. Figure 4-30 shows an enclosed type serving line which contains a refrigerated display and serving case with a refrigerated storage area below. Figure 4-30 shows one method of chilling salads on an open serving line.



Enclosed type refrigerated serving line.



Open type refrigerated serving line using crushed ice.

Fig 4-30. Refrigerated serving lines.

(2) Operation. The refrigerated serving line contains insulation and a sealed-in cooling element. Place the food to be served in the refrigerated serving line into either food inserts or individual serving bowls and place them on the display shelves. This particular part of the serving line is refrigerated; therefore, it must contain a thermometer and you must maintain a temperature chart to record the temperature inside the display compartment and the lower storage compartment.

(3) Disassembly and cleaning.

(a) Remove the food and place it in a refrigerator immediately.

(b) Remove all the shelving and take it to the pot sink for washing.

(c) Prepare a cleaning solution of baking soda or water and vinegar.

(d) Dip a wiping cloth into the cleaning solution and wipe the inside and outside of the serving line.

(e) Wipe dry with a clean wiping cloth and replace the clean shelves.

(4) Safety precautions.

(a) Be sure the refrigerated serving line is connected to an electrical outlet.

(b) Maintain the proper temperature at all times.

4-18. BULK MILK-DISPENSING MACHINE

a. Description. The bulk milk-dispensing machine (fig 4-31 and 4-32) is designed to dispense whole, fresh milk in a sanitary manner at a controlled temperature. The machine is manufactured in three sizes: 1-, 2-, or 3-container sizes. The milk-dispensing machine consists of:

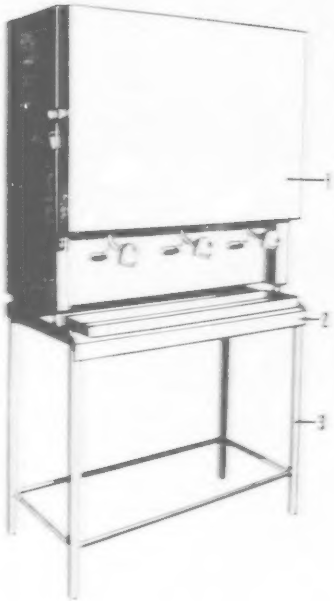
(1) A boxlike body containing a shelf to separate the upper and lower parts of the machine. The upper part contains the milk cartons.

(2) The refrigeration system which is located in the rear of the unit.

(3) A door which is formed to fit the body front and insulated to retain the cool temperature in the cabinet.

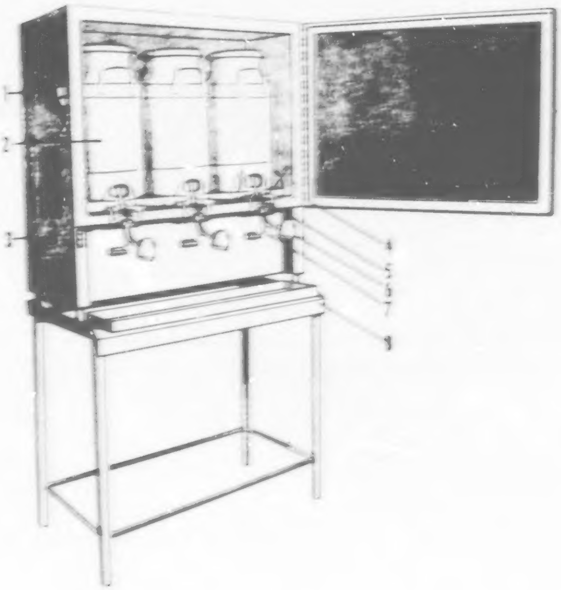
(4) A temperature gage located on the outside of the door, indicating the inside temperature. A temperature control knob is located on the side of the cabinet.

(5) The dispensing knob which is a weighted arm located at the front of the cabinet. It releases the flow of milk when it is raised.



1 Body
2 Stand
3 Legs

Fig 4-31. Bulk milk-dispensing machine (closed).



1 Latch
2 Milk can (or carton)
3 Temperature control
4 Door
5 Valve
6 Dispensing knob
7 Hose (1/4" long)
8 Stand

Fig 4-32. Bulk milk-dispensing machine (open).

b. Operation.

(1) Check the machine to be sure the refrigeration unit is on and the correct temperature has been reached. The correct temperature to maintain inside the bulk milk dispenser is within the range of 38° to 44° F.

(2) Place the milk cans or cartons into the machine.

(3) Insert the dispenser tube through the lift valve and seat the valve into the plastic well.

(4) Cut the rubber dispensing tube. The single-service tubes (other than precut tubes) must be cut with a clean cutting instrument at a point 1/4 inch below the visible lower termination of the dispensing mechanism. Some chief food service attendants keep a paring knife in a bowl of water near the bulk milk dispenser for the purpose of cutting the dispensing tube; others keep a paring knife in a container of disinfectant near the milk dispensing machine. Both these practices are unsanitary and should be avoided. When it becomes necessary to replace a bulk milk carton or milk can, go to the knife storage drawer and select a clean, sanitary knife for the job. When you finish replacing the milk carton and cutting the dispensing tube, wash the knife, dry it, and return it to the storage area.

c. Disassembly and cleaning.

(1) Remove the electric plug from the receptacle.

(2) Remove the milk containers from the dispensers, being careful to prevent spillage.

(3) Prepare a cleaning solution of baking soda and warm water.

(4) Disassemble and clean the lift valves daily. To remove the lift valve, swing the valve upward and slide the pins free of the recesses in the plastic-well valve. Push the plastic-well valve upward to remove it. Wash the plastic-well valve and the lift valve in detergent water and run them through the dishwashing machine to sanitize them.

(5) Clean the interior and exterior of the machine by wiping with a cloth wet with the soda solution and then wiping dry with a clean dry cloth.

(6) The milk-dispensing machine should be completely washed at least once daily. Spillage should be wiped up as it occurs. Frost should not be allowed to accumulate on the bulk milk dispenser.

d. Safety precautions.

(1) Be sure the dispenser is connected to the electrical outlet when in operation.

(2) Use care in replacing milk cartons to avoid dropping them.

(3) Check the temperature gage frequently to be sure the inside temperature is between 38° and 44° F.

(4) Use care in cutting the dispenser tubes to avoid cutting your fingers.

(5) Cut the tubes 1/4 inch below the lower edge of the diupensing mechanism to eliminate contamination.

4-19. POP-UP TOASTER

a. Description. The automatic pop-up toaster (fig 4-33) is used on or near the main serving line. It consists of:

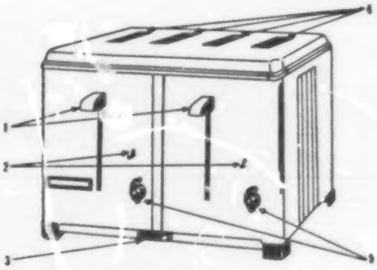
(1) A heavy chrome frame with openings in the top for inserting bread.

(2) Heating elements in each slot.

(3) A thermostat for controlling the type of toast desired.

(4) A toaster central lever which lowers the bread to the bottom of the toaster slot and automatically sets the timing and heating mechanism.

(5) The emergency toaster control button is located in the lower right-hand corner of the toaster above the thermostat. A slight push upwards will release the toaster control lever, bringing it upwards, popping the toast up ahead of schedule, and shutting off the heating and timing mechanism.



1 Bread depressor levers
2 Emergency bread extractor knobs
3 Crumb tray
4 Bread slots
5 Thermostats

Fig 4-33 Pop-up toaster.

b. Operation.

(1) Plug the electric cord into the wall receptacle and set the thermostats for the type of toast desired.

(2) Place one slice of bread in each slot, bottom side down.

(3) Depress the toaster control lever to lower the bread into the toaster and start the heating elements.

(4) Remove the toast when it is done. The automatic timing and heating device will cause the toast to pop up when it is done.

c. Disassembly and cleaning.

(1) Disconnect the electric plug from the wall receptacle.

(2) Prepare a detergent solution.

(3) Remove the crumb tray from the bottom of the toaster and empty the crumbs into a garbage receptacle. Wash the crumb tray in the detergent solution, rinse, and wipe dry with a clean wiping cloth.

(4) Using a narrow brush, remove the crumbs from the interior of the toaster slots. Use care to avoid injuring the elements.

(5) Dampen a cloth in the detergent water and wipe the exterior of the toaster. Use care not to get water into the toaster slots.

(6) Dry the toaster thoroughly and replace the crumb tray.

d. Safety precautions.

(1) Keep your hands dry when operating the pop-up toaster.

(2) Do not insert metal objects into the slots to remove jammed bread.

4-20. ROTARY TOASTER (fig 4-34)

a. Description. The rotary toaster consists of:

(1) A cabinet containg either an electrical heating element or gas burners.

(2) The thermostats for controlling the heat produced.

(3) The conveyor, a framework with a chain attached to a sprocket, used to hold the baskets to transport bread through the cabinet from the feeding point to the toast pan.

(4) The toast slide, a sheet of metal that acts as a slide for the toast from the end of the conveyor to the toast pan.

(5) The handwheel, which is used to manually advance the conveyor.

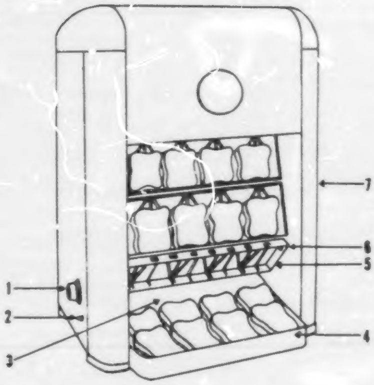
b. Operation.

(1) Set the thermostat to the desired heat.

(2) Turn the motor switch to the ON position. The conveyor will automatically start.

(3) Place the bread on the baskets. The conveyor will carry the bread past the heating unit, to the toast slide, and the bread will drop into the toast tray. If a slice of bread should jam or stick to the toaster during the toasting process, use the handwheel to rotate the conveyor until the slice is freed.

(4) When the toasting process is completed, turn the motor switch and the thermostat to the OFF position. Remove the electric plug from the electric receptacle. In the case of a gas-operated toaster, turn off the gas cock.



1 Thermostat
2 Motor switch
3 Toast slide
4 Toast pan
5 Toast basket
6 Basket locking pin
7 Handwheel (not shown)

Fig 4-34. Electric rotary toaster.

c. Disassembly and cleaning.

(1) Locate the toast pan and toast slide.

(2) Grasp the toast pan, lift it up and out of the bottom of the toaster.

(3) Remove the toast slide by lifting it up and away from the conveyor. Lift it out.

(4) Remove the baskets by grasping them firmly with one hand and pulling sideways to release the basket from the locking pin on the conveyor chain.

(5) Make a detergent solution and, using a wiping cloth, wash the sides, back, and bottom of the toaster area as far as accessible. Keep water off the conveyor chain.

(6) Dampen a second wiping cloth in clear water, wring dry, and wipe the interior of the toaster to remove all traces of detergent.

(7) The toast pan, toast slide, and baskets may be washed at the pot sink and sanitized in the dishwashing machine, air-dried, and replaced in the toaster.

d. Safety precautions.

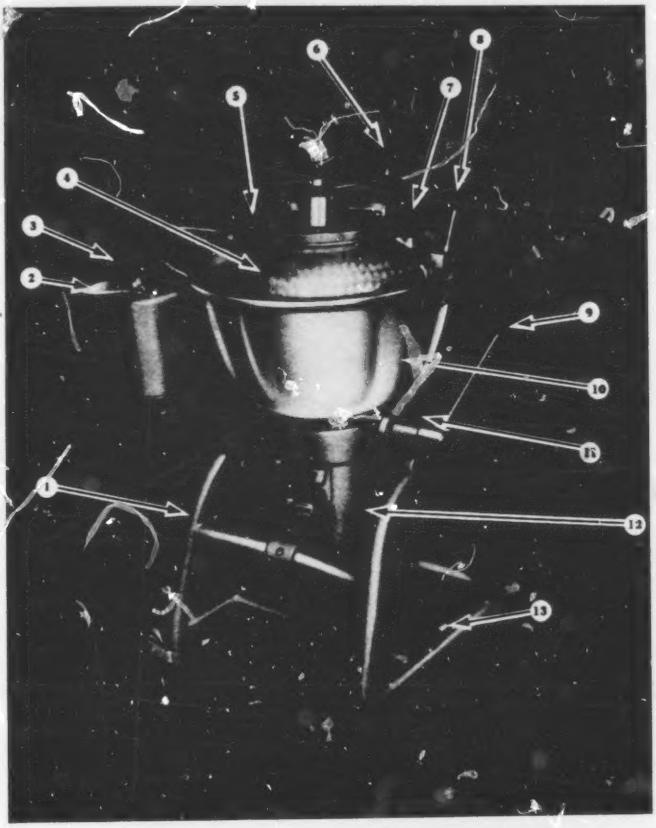
(1) Keep your hands dry when operating the toaster.

(2) Shut off the source of heat and disconnect the wall plug when not in use.

(3) Keep your hands clear of the heating units and use care when placing bread on the conveyor.

4-21. VERTICAL CUTTER/MIXER (fig 4-35)

a. Description. The vertical cutter/mixer is designed to cut and mix large quantities of foods simultaneously in a matter of seconds and still retain a high-quality product. The vertical cutter/mixer consists of:



1 Frame
2 Manual rotary switch
3 Manual rotary switch knob
4 Bowl cover
5 Inspection cover knob
6 Mixing baffle crank handle
7 Bowl cover knob
8 Bowl cover locking clamp
9 Locking handle (brake)
10 Bowl
11 Bowl locking pin
12 Motor housing
13 Stud

Fig 4-35. Vertical cutter/mixer.

(1) The stainless steel bowl which pivots 90° for unloading.

(2) The bowl cover is made of cast aluminum. When the cover is closed, it becomes part of the cutter-mixer bowl. It is counterbalanced for easier operation and contains a removable inspection cover for checking the progress of the operation without opening the lid itself. A mechanical safety interlock prevents opening the bowl cover to its raised position when the cutter/mixer motor is still in motion.

(3) The mixing baffle is manually operated. It is a piece of cast aluminum designed to move the products being cut/mixed into the cutter knives. The mixing baffle is removable.

(4) A bowl-positioning lever or locking handle is provided for holding the bowl in any tipped position desired. It also serves as a brake when you tilt the bowl while filling it with a heavy load.

(5) The knives are made of cutlery stainless steel, scimitar-shaped, and designed to make a clean cut. The knives are mounted directly on the motor shaft that extends through the bottom of the bowl. They rotate at a high speed and at a fixed angle that cause the product to be pulled down through the central position of the bowl, slicing it in the process. The product is then returned up the sides of the bowl by centrifugal force. A whirlpool action is created inside the bowl, which keeps the entire load in motion. The hand-operated mixing baffle (fig 4-36) supplements this action by turning the product over in a rolling motion, moving the product into the knives.

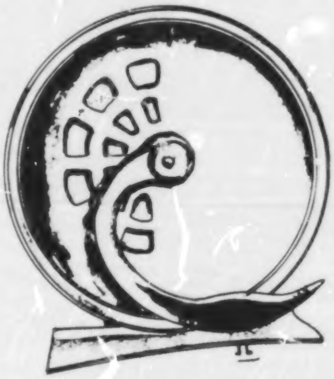
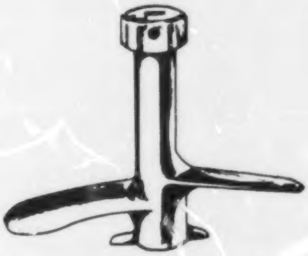
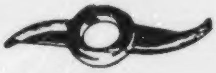


Fig 4-36. Inspection cover (inside view), showing the hand-operated mixing baffle.

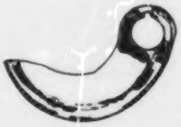
(6) The knead/mix shaft (fig 4-37) is designed of 1-piece cast aluminum. It is used for processing yeast doughs and mixing products that require no cutting action such as cakes, icings, and liquid mixtures.



Knead/mix shaft



Wing nut



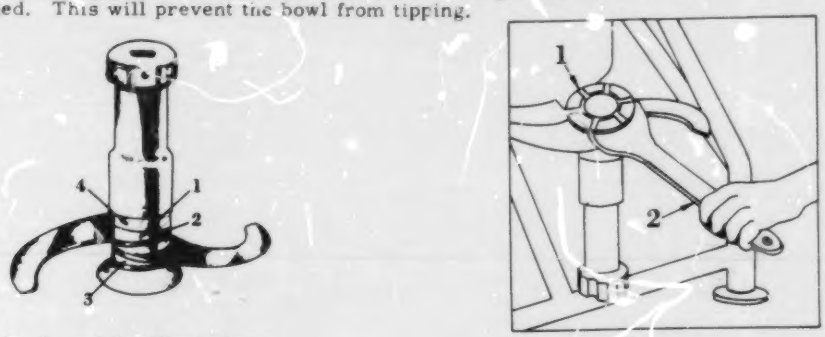
Scimitar-shaped knife blade

Fig 4-37. Knead/mix shaft, wing nut, and a scimitar-shaped knife blade.

(7) A wing nut (for the knife shaft) (fig 4-37) screws onto the lower portion of the standard knife shaft in place of the regular locking nut. The wings act as wipers on the bottom of the bowl and eliminate product buildup on the bowl bottom. Occasionally oily products (nuts, cheeses, and fats) have a tendency to heat up during processing and stick to the bottom of the bowl. If this occurs in processing a product, a wing nut should be used to

prevent damage to the knives and also to improve the cutting and mixing action of the product.

b. Operation. Before operating the vertical cutter/mixer, make sure the knives are correctly mounted on the knife shaft. To raise or lower the knives on the shaft, you must first place the knife shaft on the stud located on the bottom of the frame (13, fig 4-35). Next remove the base nut (fig 4-38) from the knife shaft with the open-end wrench. Then remove the knives, slant rings, and spacers. To lower the knives, place the large flat spacer (No. 4, fig 4-38) on the shaft first; to raise the knives, put the large flat spacer on last. Be sure the numbered slant rings (Nos. 1, 2, 3, fig 4-38) run down toward the bottom of the shaft, No. 1 on top, No. 2 next, and No. 3 on the bottom. You must also be sure the bowl is raised to the vertical position, the bowl locking pin is locked in the horizontal locking hole, and the bowl lock handle is tightened. This will prevent the bowl from tipping.



1, 2, and 3 = Slant rings
4 = Large spacer

Removing base nut (1), with open-end wrench (2).

Fig 4-38. Vertical cutter/mixer knife.

(1) To operate the machine you place the ingedients to be cut/mixed into the bowl. In most cases all the ingredients are placed into the bowl at one time; however, there are exceptions and the following methods are used for adding ingredients.

(a) For finely cut products from large or bulky items such as loaves of bread or large chunks of meat, you should:

1. Limit the length of the product because it must be free to drop into the cutting blades.

2. Run the machine briefly to break down large chunks, then add the balance of the load.

3. Remove the baffle when adding large chunks of frozen foods.

(b) When preparing baking items, always add the shortening last. This prevents the shortening from smearing the bottom of the bowl. Dissolve sugar in liquid before adding other ingredients.

(c) Cut vegetables in water. Fill the bowl about 1/2 full of cold water add the vegetables and cut them.

(d) Do not exceed 80% of the bowl capacity when mixing liquid products such as salad dressing, ice-cream mix, or reconstituting dry milk.

(2) To unload the machine, you MUST make sure the motor has stopped and the blades have stopped turning. Then you may open the bowl cover.

(a) Remove the knife accessory before emptying the bowl. When using a noncutting accessory such as the knead/mix shaft, you do not have to remove it.

(b) Scrape the bowl cover if it is required before tipping the bowl.

(c) Remove the bowl locking pin and slightly loosen the bowl lock handle (which can be used as a brake should the bowl tend to tip too easily). The bowl may be locked in various positions with this lock handle. Cautiously tip the bowl by grasping the cover knob (7, fig 4-35). Pull the bowl toward you and empty the contents into a container.

c. Cleaning procedures.

(1) Between operations.

(a) Fill the bowl 1/3 full of warm water.

(b) Add a small amount of detergent.

(c) Close the bowl cover and the inspection cover.

(d) Start the machine on low speed, then switch to high speed.

(e) Turn the baffle counterclockwise.

(f) Operate the machine for 10 seconds.

(g) Turn the motor off. WAIT FOR THE KNIVES TO STOP TURNING, then open the cover.

(h) Remove the knife accessory and disassemble and clean it separately.

(i) Remove the baffle and bowl cover gasket and clean them separately.

(j) Drain the water from the bowl, rinse with clear water, and wipe it dry.

(2) Daily cleaning.

(a) Remove the knives, baffle, and bowl cover gasket and wash them separately.

(b) Place 1 gallon of detergent water into the bowl.

(c) Using a long-handled bowl brush, liberally brush the inside of the bowl and the underside of the cover. Next brush the outside of the bowl and bowl cover.

(d) Rinse the entire inside and outside of the machine with clear water and wipe dry with a clean cloth.

d. Safety precautions.

(1) Make sure the knife accessory is properly assembled before operating the machine.

(2) Make sure the bowl cover is closed and latched before turning the machine on.

(3) Lock the bowl in a vertical position before turning on the machine.

(4) Be sure the knives have stopped turning before opening the machine.

(5) Remove the knife accessory before emptying the bowl.

(6) Do not exceed the manufacturer's recommended capacities when filling the vertical cutter/mixer.

4-22. SUMMARY

The food service equipment you will be using in the Marine Corps dining facilities is exactly the same as that which is used in many civilian restaurants. The equipment varies in style and design; however, the operation, cleaning, and safety precautions remain similiar no matter who makes the item. Food service equipment is that equipment which is large and too bulky to carry about the galley easily. You should keep in mind that a majority of the equipment you will be using is electrically operated. This does not mean it is automatic. Whenever you are operating any piece of equipment, whether it is electric or manually operated, you must use care, be observant, and practice the safety rules that apply.

Section II. FOOD SERVICE UTENSILS

4-23. INTRODUCTION

Food service utensils are the handtools used in a dining facility with the exception of the platform scale. The food service utensils are normally cleaned in the pot sink and should be sent through the dishwashing machine for sanitizing.

4-24. SCALES

The best way to determine the exact amount of an ingredient is to weigh the item rather than to measure it since the weighing process is much more accurate than the measuring process. There are many types and styles of scales used in food preparation, but you should be familiar with the three basic types: platform scale, even-balance scale, and portion scale.

a. Platform scale (fig 4-39). The platform scale is used to weigh bulky subsistence items. It is normally kept near the storeroom or unloading areas for the purpose of weighing bulk items as they are received. The platform scale is mounted on four metal wheels for mobility. The balancing beam is graduated into 1/2-lb subdivisions up to 100 lb. It has a counterbalance with an eye for attaching a hook and a plate for placing compensating weights on the beam. The additional counterweights come in 100-, 200-, and 400-lb sizes and can be used singly or in combinations.

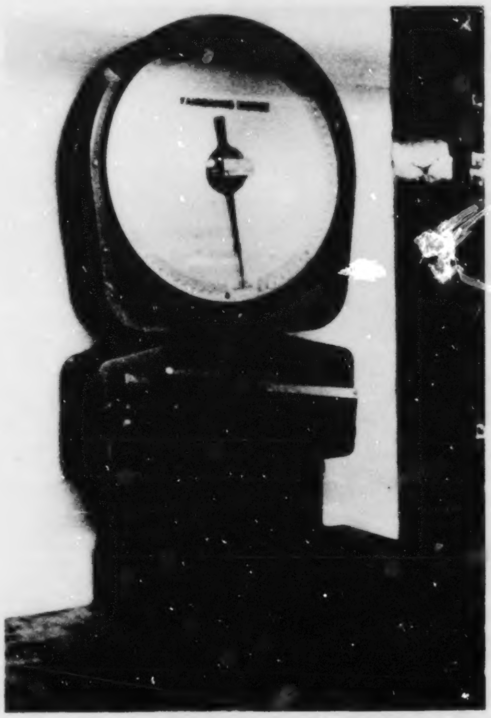


Fig 4-39. Platform scale.

b. Even-balance scale.

(1) Description. The even-balance scale consists of a metal base with a center post constructed to balance a graduated beam. The beam is graduated into 1/4 oz subdivisions, reading up to 1 lb. This beam has a round platter attached to one end and a metal scoop on the other. Each end has a metal cup containing small metal pellets for balancing the scale beam. Each scale has counterweights of 1-lb, 2-lb, and 4-lb capacities.

(2) Operation. Face the scale with the graduated beam and counterweight towards you. With the scoop on the scale and platter empty, place the counterweight on zero on the bar. The bar should be evenly balanced now. If not, unscrew the platter and either add or remove the metal pellets from one cup to the other until an even balance is obtained. To determine the weight of an item, place the item to be weighed in the scoop on the left platter and put the counterweights on the right platter. Move the sliding counterweight until the balancing beam is balanced. You can reverse this procedure by placing the required number of counterweights on the right platter and placing the item to be weighed gradually into the scoop on the left until an even-balance is reached.

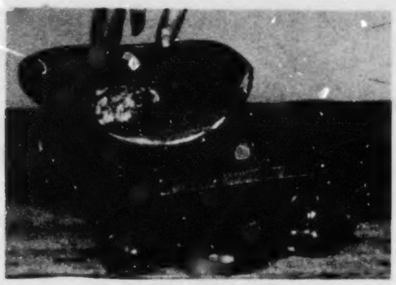


Fig 4-40. Even-balance scale.

c. Portion scale (fig 4-41). The portion scale is used to weigh portions of food for exact individual servings. An example of this would be when slicing beef servings at the serving line and you want everyone to receive the same-size portion. A portion scale used here to weigh every 8th or 10th portion served would be a good control check. A portion scale can be used in many situations in the dining facility to maintain portion control. The portion scale has a large square platform on top for placing the item to be weighed. The dial is graduated from 1/4 ounce to 32 ounces. The weight is indicated by a rotating arrow pointing to the weight of the item on the platform.

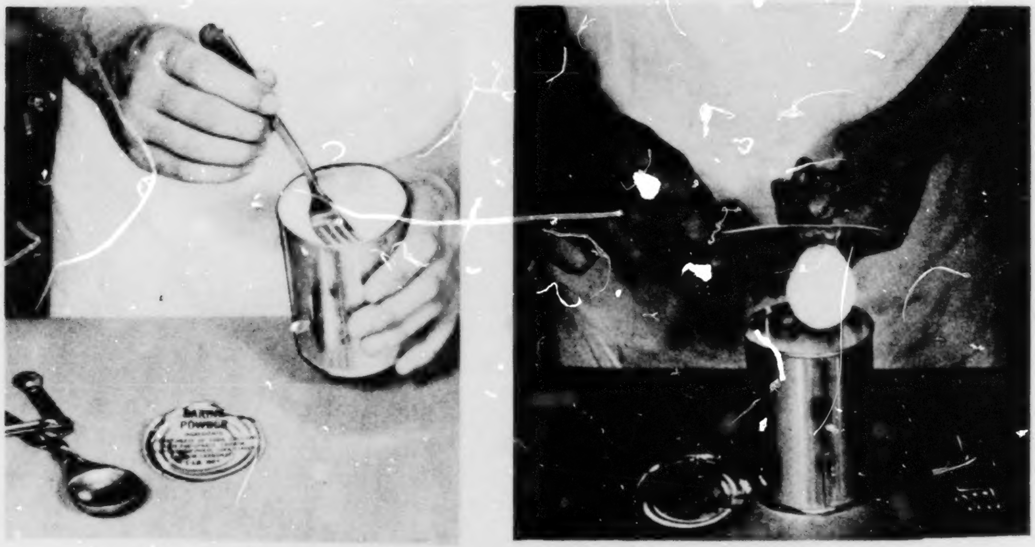
Fig 4-41. Portion scale.

4-25. MEASURING DEVICES

The Armed Forces Recipe Service, MCO P10110.16B contains recipes that have a Weights column and a Measures column so that the ingredients may be weighed whenever possible. There are, however, times when weighing is impractical and the measuring devices must be used. The various measuring devices are:

a. Measuring spoons. The measuring-spoon set (fig 4-43) contains four spoons consisting of a 1/4-teaspoon, 1/2-teaspoon, 1-teaspoon, and 1 tablespoon measure. When using the measuring spoons for measuring dry ingredients, you should remember that measures are always made with a level spoonful, not a heaping spoonful (fig 4-43).

Fig 4-42. Measuring-spoon set.

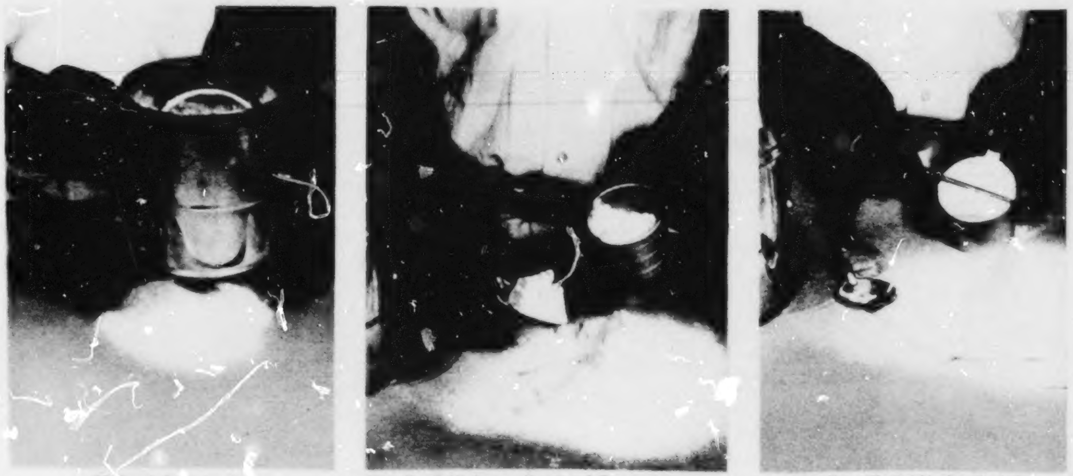


Stir baking powder lightly before measuring.

Dip dry measuring spoon into baking powder, bring spoon up heaping full, and level with straight edge of a knife.

Fig 4-43. Using a measuring spoon.

b. Measuring cups. The measuring cups you will be using come in various sizes. One measuring-cup set contains 1/4-cup, 1/3-cup, 1/2-cup, and 1-cup measures; larger sets contain 1-pint, 1-quart, 1/2-gallon, and a 1-gallon measure. These measuring-cup sets are usually made of metal. The larger ones have a lip for easier pouring and are graduated to indicate whether they are 1/4, 1/2, 3/4, or completely full. When using the measuring sets to measure dry ingredients such as flour, you must first sift the flour, then spoon it lightly into the cup and level it off with a knife (fig 4-44). When measuring a moist item such as shortening or brown sugar, you must pack it into the measuring device firmly to avoid leaving air spaces which result in an inaccurate measure (fig 4-45).

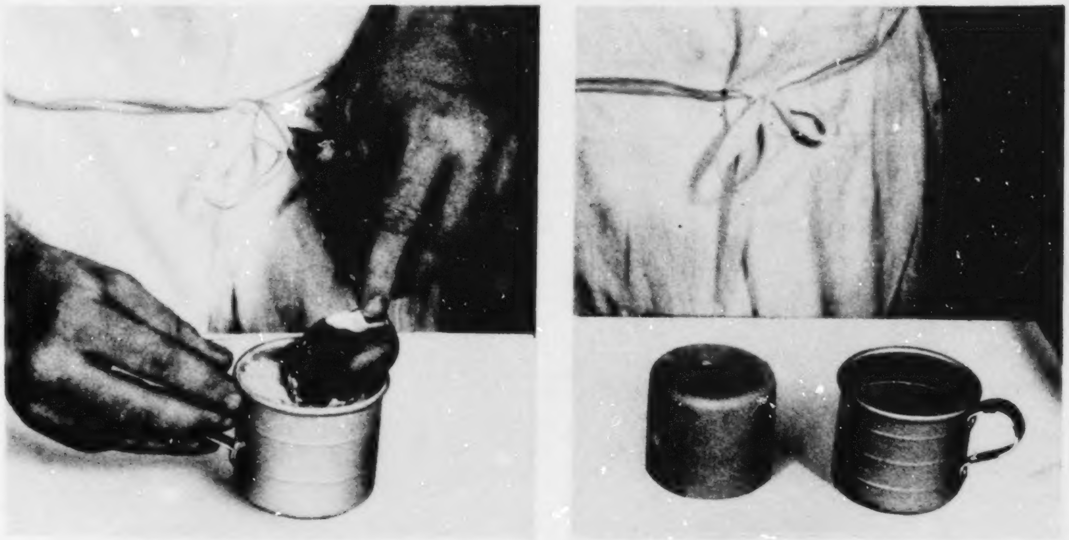


Sift flour before measuring.

Place flour lightly in cup. Do not pack flour or shake the cup.

Level flour with straight edge of a knife.

Fig 4-44. Measuring dry ingredients.



Pack brown sugar firmly into cup.

If properly packed, sugar will be firm and compact when turned out of cup.

Fig 4-45. Measuring moist ingredients.

4-26. WIRE WHIPS

Wire whips (fig 4-46) are used for whipping light gravies, sauces, and eggs. They are used to blend dry ingredients with liquid ingredients to make a smooth paste. Two types of wire whips that you will encounter are the French whip which is made of heavy wire, and the piano whip which is made of a lighter wire. Their use depends on the consistency of the item being whipped.

4-27. ROASTING PANS

Roasting pans (fig 4-46) are rectangular aluminum pans with high sides. They are used for beef, pork, and poultry. They can be used either with or without a cover.

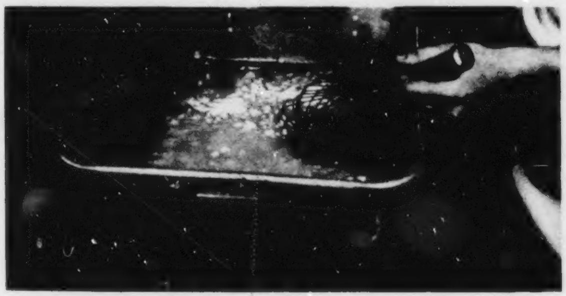


Fig 4-46. Using a wire whip to blend dry and moist ingredients in a roasting pan.

4-28. STOCK POTS

A stock pot is a large round pot with high sides (fig 4-47). It is made of aluminum and has two lifting handles. Stock pots are used for boiling and simmering foods. They vary in size from 20- to 60-qt capacity.

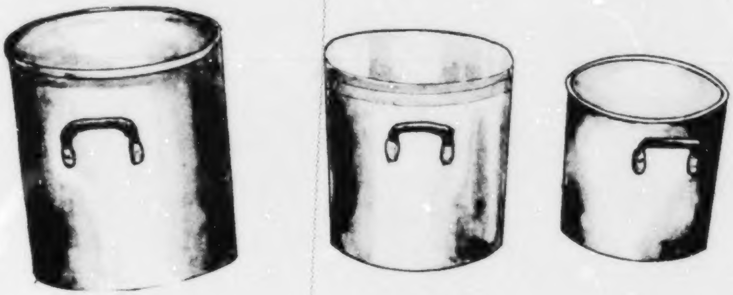


Fig 4-47. Stock pots, 60-, 40-, and 20-qt.

4-29. SHEET PANS

A sheet pan is a rectangular pan used for baking cakes, cookies, pastries, and some types of meats (fig 4-48). They come in various sizes. The size you will most often use is 18 inches wide and 24 inches long.

Fig 4-48. Arranging bacon in a sheet pan.

4-30. SAUCE PANS

A sauce pan (fig 4-49) is used for cooking small quantities of food on top of the range. It comes in various sizes ranging from 1 1/2-qt to 8 1/2-qt capacity. The sauce pan has a long handle with a hole in the end for hanging it on the pot rack when not in use.

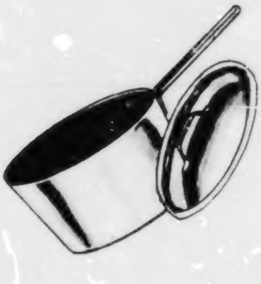
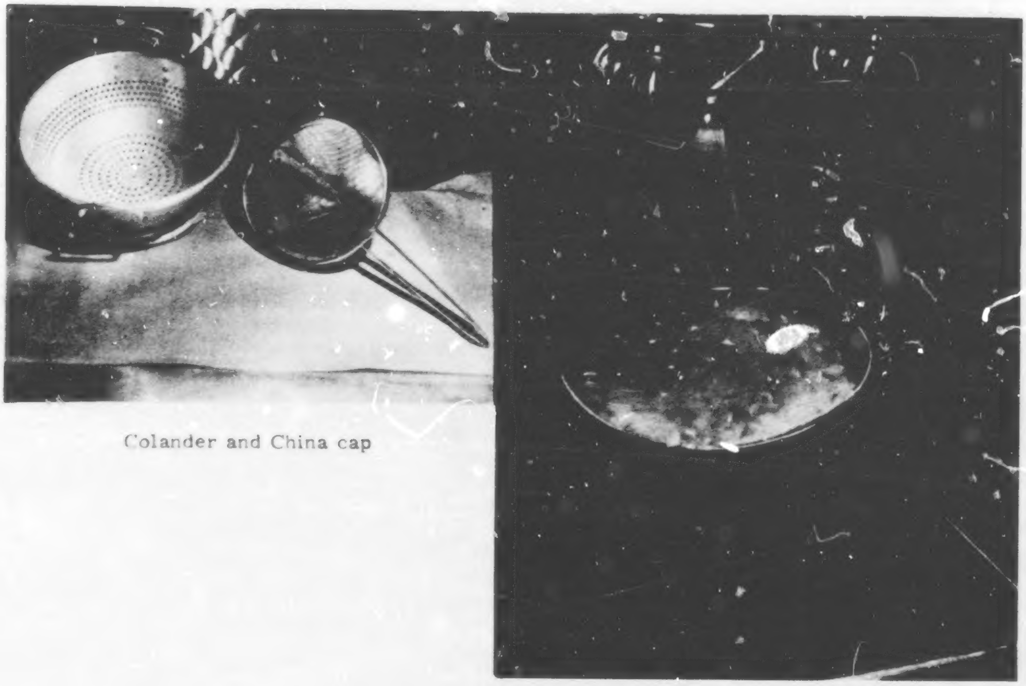


Fig 4-49. Sauce pan with lid.

4-31. COLANDER AND CHINA CAP

The colander is a stainless-steel or aluminum bowl-shaped strainer (fig 4-50). It is perforated so that liquids run off. It is used for straining foods and rinsing paste products. The China cap is a pointed strainer shaped like a Chinese hat. It has a hook on one side and a long handle on the other so it can cross the top of large pots (fig 4-50). It is used to strain soups, gravies, and sauces and to rinse macaroni (4-50) and spaghetti.



Colander and China cap

Rinsing macaroni in a China cap

Fig 4-50. Colander and China cap.

4-32. SERVING UTENSILS

The items we classify as serving utensils are those items which we use mainly to serve the food on the chow line, but they can also be used for food preparation.

a. Ladles. Ladles vary in sizes from 1 oz to 32 oz (fig 4-51). They are used to serve liquid and solid foods; therefore, some ladles are perforated to allow liquids to drain off. You should use the correct-size ladle for the job you are doing. It doesn't make good sense to use an 8-oz ladle to serve a person 2 oz of gravy on his potatoes.

Fig 4-51. Ladles.

b. Serving spoons. Serving spoons may be solid, slotted, or perforated depending on their use. A solid spoon is used to serve items with their liquids; a slotted spoon, to serve large vegetables without their liquids (boiled potatoes, cabbage); and a perforated spoon, to serve small vegetables without their liquid (diced carrots, peas, corn).

c. Cook's fork. The cook's fork (fig 4-52) is a 2-pronged fork used to lift, turn, or move large or small pieces of food in a sanitary and practical manner.

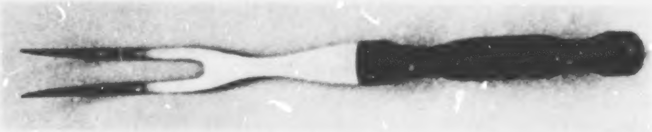


Fig 4-52. Cook's fork.

d. Ice-cream scoops. The ice-cream scoop is used to ladle or remove ice cream from a container in even portions. The ice-cream scoop has a metal device which cuts the ice cream free of the scoop when a lever is depressed. Ice-cream scoops come in various sizes which are indicated by a number stamped on the bowl of the scoop. The number on the bowl indicates how many scoopfuls are required to make 1 quart. The ice-cream scoop is a valuable tool to use for portion control. It can be used for portioning meatballs, croquettes, potatoes, and some salads, as well as ice cream.

e. Food tongs (fig 4-53). Food tongs are U-shaped, spring-type, metal, serving utensils. They are used to pick up, turn, and serve various foods during the cooking process and on the serving line.

Fig 4-53. Food tongs.

f. Pie and cake server (fig 4-54). The pie and cake server is used to serve pies, cakes, and other pastries. It can also be used to serve other food items.

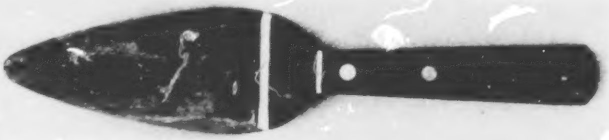
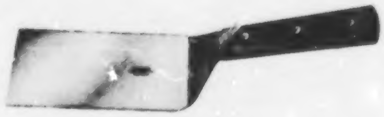
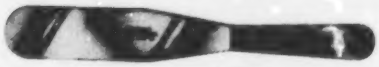


Fig 4-54. Pie and cake server.

g. Spatula. Spatulas (fig 4-55) vary in size and shape depending on the job they are designed to perform. They are used for mixing, scraping, serving, and spreading.



Offset style



Flat style

Fig 4-55. Flat and offset spatula.

h. Skimmer. The skimmer is a perforated, flat stainless steel disk with a long handle. It is used to skim grease or food particles from gravies, soups, and stocks.

4-33. KNIVES

Probably the most used and misused tools you will encounter in the dining facility are the knives used in the galley for food preparation. Knives are tools, not toys. They are used for cutting food and should not used as screwdrivers, box openers, coffee can openers, band cutters, or weapons. Each knife has a specific use and was designed to do a specific job.

a. Storage of knives. Knives should be stored in a cabinet or drawer that has slotted wooden strips to separate each knife to prevent damaging the blades. Each cooks' watch should have its own knife cabinet or knife drawer.

b. Washing. Knives should be hand-washed in hot detergent water, rinsed, and dried with a clean cloth. Do not allow wooden-handled knives to soak in the wash or rinse sink. The water will cause the wooden handle to swell and, when it dries, the handle will not shrink back to its original shape. It will thus become loose and food particles are liable to collect in the splits and cracks around the knife's rivets and tang, causing a possible sanitation hazard. Knives left in a sink of water are a major cause of serious cuts on the hands of an unknowing cook reaching into the water.

c. Description and uses of various knives. The following is a list of some of the knives you will be using:

(1) Butcher knife (fig 4-56). The butcher knife is a heavy-bladed knife, used to cut large pieces of meat and steaks. The scimitar-type steak knife is a butcher knife with a curved blade.

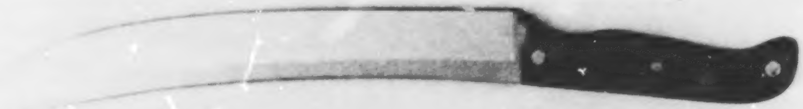
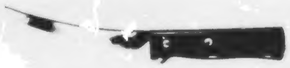
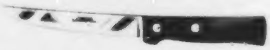


Fig 4-56. Butcher knife (scimitar type).

(2) Boning knife (fig 4-57). The boning knife blade is approximately 6 inches long, narrow, either stiff or flexible, straight or curved, and is used for removing bones from meat or poultry.



Curved boning knife



Straight boning knife

Fig 4-57. Boning knives.

(3) Roast slicer. The roast slicer is a long, narrow, flexible-bladed knife used to slice thin slices of meat from cooked roast beef and ham or to slice meat from the breast of a turkey (fig 4-58).

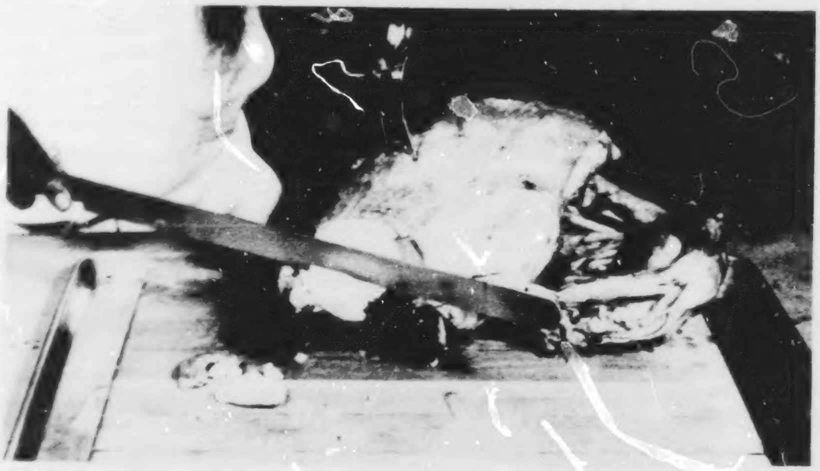


Fig 4-58. Using a roast slicing knife to carve turkey.

(4) Paring knife (fig 4-59). The paring knife is a short-bladed knife used to pare fruits and vegetables and to remove the eyes from potatoes.

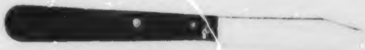


Fig 4-59. Paring knife.

(5) French knife (fig 4-60). The French knife is probably the most commonly used knife in the dining facility. It is also called the "cook's knife" or the "all-purpose knife." The blade is very wide near the handle and tapers to a point. The French knife is used for cutting, slicing, and chopping.

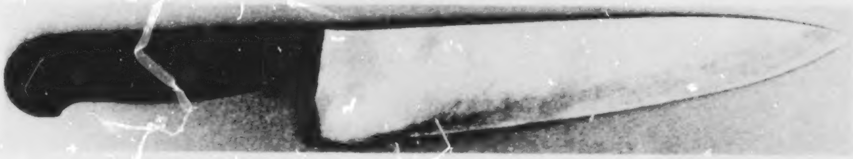


Fig 4-60. French knife.

d. Sharpening knives. When a knife becomes dull, it should be sharpened on a water stone or carborundum oilstone. Never sharpen a knife on a power- or hand-driven dry stone because this will remove the temper from the cutting edge. Figure 4-61 shows a 3-sided sharpening stone and a steel. Figure 4-62 shows the proper method of sharpening a knife: anchor the stone by placing it on a piece of wet cloth; sharpen the knife on the rough side of the stone first, then on the smoother side; when the knife has enough edge, thoroughly clean the blade and handle.

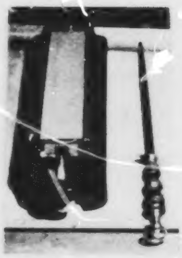
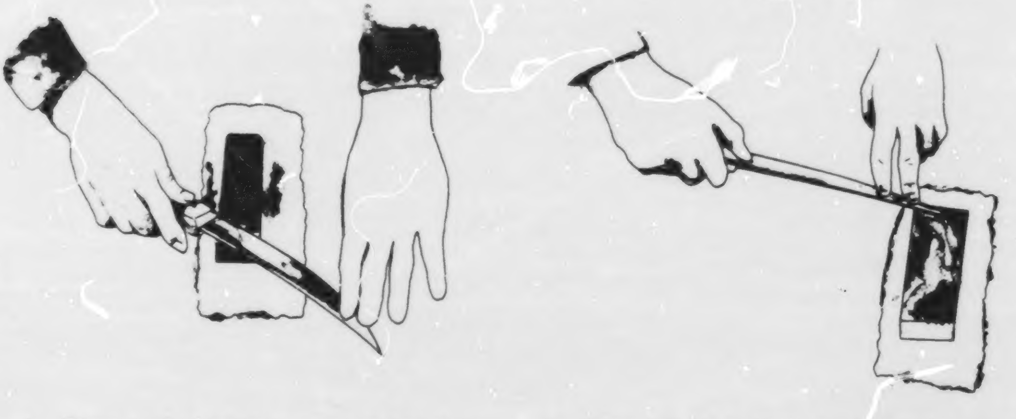


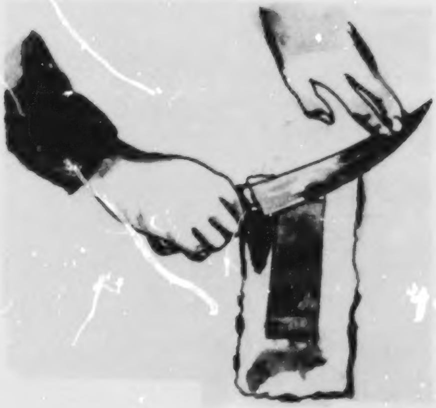
Fig 4-61. 3-sided sharpening stone and a steel.



1. Place heel of knife at upper end of stone.

2. Draw full blade (from heel to toe) across full length of stone.

Fig 4-62. Sharpening a knife.



3. Turn knife over and repeat procedure starting with heel at opposite end of stone.

Fig 4-62. Sharpening a knife--continued.

e. Steeling a knife. After the knife has been sharpened on a stone, the blade must be turned so that the edge will be in perfect condition. Steeling does not sharpen a knife. The steel is magnetized and picks up small particles and burrs on the edge of the knife. A few strokes of the knife on the steel are usually enough to true the edge of the knife. Figure 4-63 shows the proper method of holding the knife and steel.

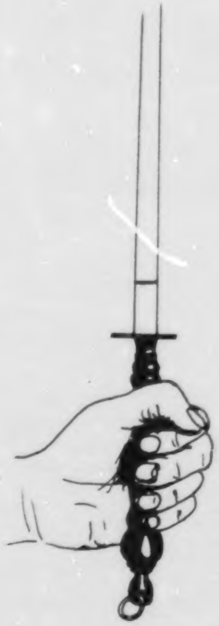


Fig 4-63. Proper method of holding the steel and knife for steeling.

To steel the knife (figs 4-64 and 4-65), place the heel of the knife against the near side of the tip of the steel. With a quick, swinging motion, bring the edge of the knife along the steel from the heel to the tip approximately 3/4 the length of the steel. Repeat this procedure with the other edge of the blade, this time with the heel of the blade against the far side of the tip of the steel. Alternate from side to side about six strokes on each side.

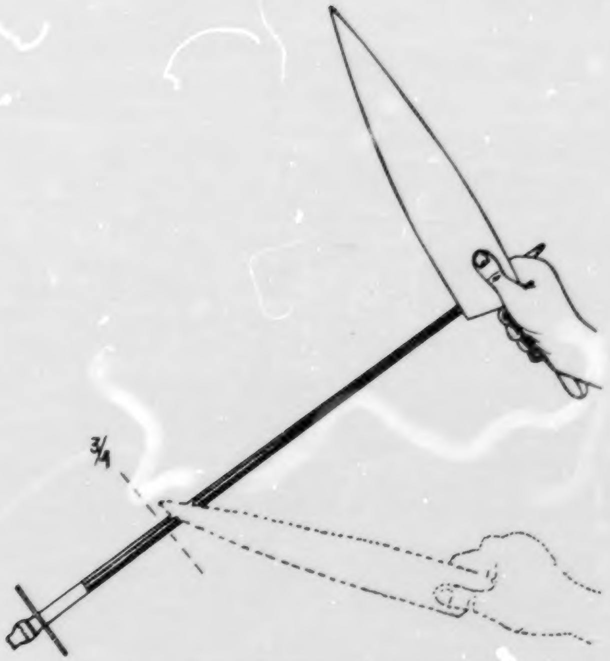


Fig 4-64. Steeling a knife: 1st stroke.

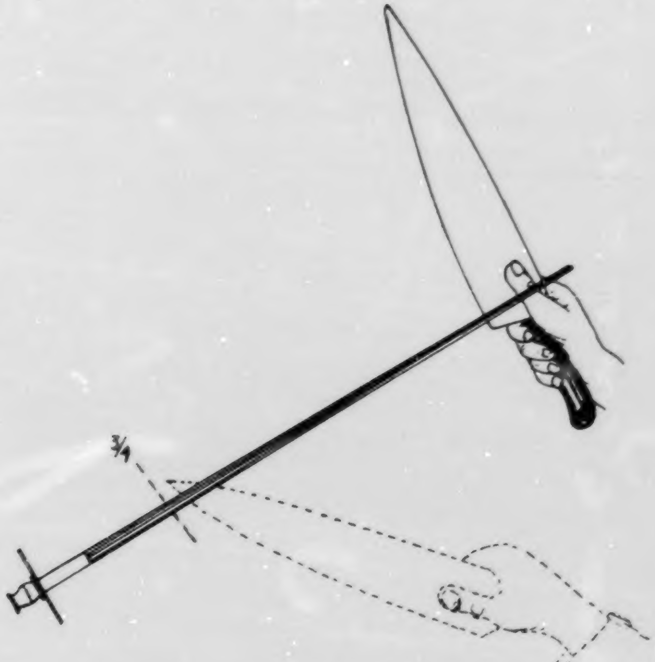


Fig 4-65. Steeling a knife: 2nd stroke.

When steeling a knife, you only use 3/4 the length of the steel. This is a safety precaution to prevent a serious cut on the hand. It will also prevent hitting the handguard, which causes nicks on the knife edge.

f. Safety precautions to observe when handling or sharpening knives.

(1) Keep the handles of the knives clean and dry. Greasy or wet handles can cause very serious accidents.

(2) Grip the knife firmly.

(3) Use only sharp knives. A sharp knife results in accurate and rapidly finished work with minimum effort. A dull knife usually results in poor uniformity and appearance of the food and in wasted time. The extra force required to cut with a dull knife causes slipping and results in cuts.

(4) Pick up knives by the handles, not the blades.

(5) Finally, use the knife designed for a particular job.

4-34. VEGETABLE PEELER

The hand vegetable peeler (fig 4-66) consists of a blade shaped in the form of a flat loop with the inside edges sharpened. The blade is attached to the handle by a pin so that it can swivel from side to side in order that it may cut in two directions. The rounded point can be used to remove the eyes from potatoes.

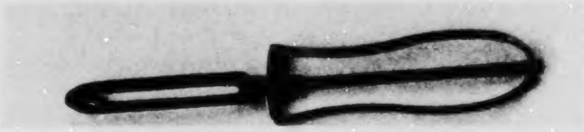


Fig 4-66. vegetable peeler.

4-35. PASTRY WHEEL (PIZZA KNIFE)

The pastry wheel (fig 4-67) is a circular knife mounted on a handle. It is used to cut pizza and other pastries.

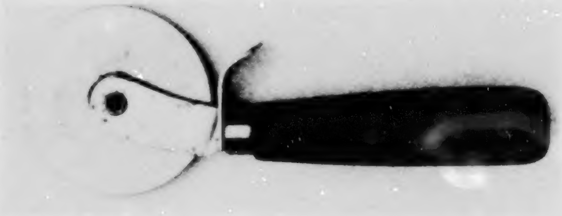


Fig 4-67. Pastry wheel.

4-36. THERMOMETERS

Thermometers take much of the guesswork out of cooking. The four types of thermometers that you will be using are:

a. Oven thermometer. Even though the range or oven is equipped with thermostats, you should still use an oven thermometer to insure an accurate temperature reading.

b. Deep-fat thermometer. The deep-fat-frying thermometer is used to determine when the grease in the fryer has reached the proper cooking temperature.

c. Refrigerator thermometer. The refrigerator thermometer is used to indicate the temperatures inside the walk-in and reach-in refrigerators.

d. Meat thermometer. The use of a meat thermometer (fig 4-68) is the most dependable method of determining when a roast or turkey has reached the desired degree of doneness. During cooking, meat becomes hot on the outside first and gradually heats up to the center. When the center of the meat reaches a certain temperature, the meat has reached a certain degree of doneness. Most meat thermometers are marked to show the internal temperatures at which a turkey, lamb, fresh pork, or veal roast will be well done and the temperature at which a beef roast will be rare, medium, or well done. The thermometer should be inserted in the thickest part of a roast or in the thigh of a turkey. The bulb of the thermometer should be kept away from fat pockets and bone. Bone is a poor conductor of heat, and a false reading can result if the bulb is resting against a bone. A layer of fat around the bulb of the thermometer will act as an insulator and will also cause an incorrect reading to be given.

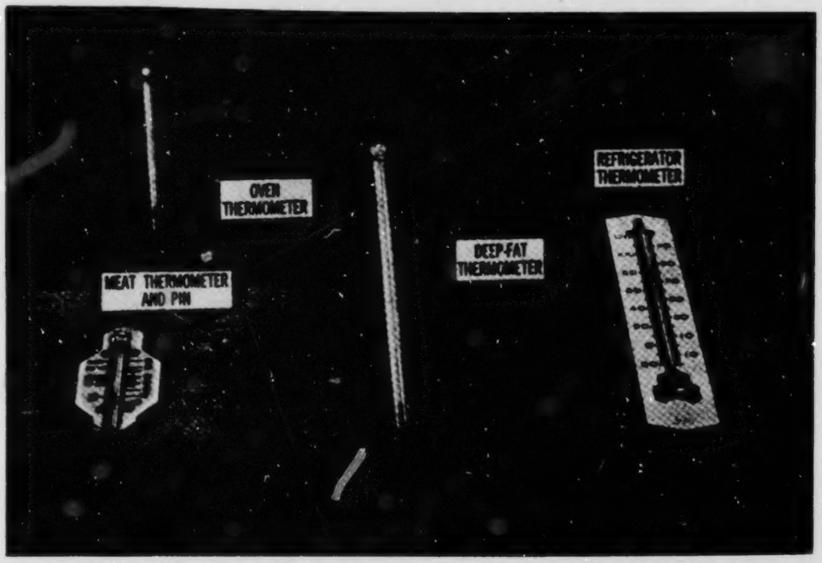


Fig 4-68. Thermometers.

4-37. CUTTING BOARD

The cutting board is used to cut or chop foods with a knife. Its purpose is to protect the worktable and the knife from being damaged while in use. Rubber cutting boards are recommended for use in dining facilities. When using the cutting board, be sure to set it on a solid surface. The cutting board must be throughly scrubbed and sanitized after each use to prevent bacteria from being transmitted from the board to the food being prepared.

4-38. GENERAL SAFETY PRECAUTIONS

In many of the preceding paragraphs, safety precautions for the various food service equipment and utensils were stressed. It is your responsibility to learn how to perform your assigned tasks in a safe manner. The correct way to do a job is to do it the safe way. Cuts, burns, and falls are usually caused by someone being careless or engaging in horseplay while operating a dangerous piece of equipment. If you are not certain about the correct way to do a job, ask your chief cook or whoever is placed in charge of your particular assignment how to do it. The following general safety precautions should be practiced when working in the dining facility.

a. Lifting. When carrying out lifting operations, observe these rules:

(1) Keep your back straight, bend your knees, and let your leg muscles do the work.

(2) Ask for help when lifting or carrying heavy or bulky objects.

(3) Never attempt to lift anything when you are in an awkward position.

b. Climbing. Always use a ladder when climbing. Makeshift ladders should not be used. Ladders should be equipped with safety feet.

c. Running. Running in the dining facility is prohibited except in an emergency.

d. Safety and operating instructions. The safety and operating instructions for each piece of equipment must be mounted either directly on the equipment or directly adjacent to it so that they are readily visible to the equipment operator.

e. Electrical equipment. Disconnect electrical equipment before cleaning it.

f. Stacking. Do not stack cases of food so high that they are liable to fall. Do not place items on shelves or bins in such a manner that they protrude into the aisles.

g. Checking before locking refrigerators. You must determine by a visual check that everyone is out of the walk-in refrigerators, freezers, and storerooms before locking them.

The above list is only a small portion of the safety rules that apply in our dining facilities. Safety is everyone's job. Accidents are caused; they just do not happen without reason. You must tell others when you see a potential hazard; or, if you see someone failing to observe safe practices, you must remind him of the danger of disregarding safety precautions. Remember that the victim of carelessness is usually someone other than the cause of the carelessness.

4-39. SUMMARY

Food service utensils are also varied in size, shape, and design according to the manufacturer, but the operation, cleaning, and safety rules still apply. Food service utensils are those items which are easily carried about the galley as you work. Many good cooks have their own set of knives which they care for and never allow others to use. You do not have to purchase your "tools of the trade"; however, you should treat your equipment and utensils as if you owned them. Take care of them. Use the tool which was designed to do a particular job for that job alone. Store them properly. Never throw knives in a drawer; you should have a cabinet or a slotted rack for knife storage. Above all, use common sense when working in the dining facility. Horseplay has no place here. There are too many ways you or someone else can be injured through this dangerous behavior.

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UNITED STATES MARINE CORPS
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FOOD SERVICE FUNDAMENTALS

Course Introduction

FOOD SERVICE FUNDAMENTALS has been designed to provide you with a general background in the basic aspects of the food-service program in the Marine Corps. Although the actual skills must be gained by field experience, the course will instruct you in the fundamentals of sanitation and personal hygiene, food-borne illness, food service equipment, utensils, and safety precautions necessary for you to acquire the skills needed for the performance of your duties as a Marine cook.

ORDER OF STUDIES

Lesson Number	Study Hours	Reserve Retirement Credits	Subject Matter
1	2	0	Introduction to the Food Service Program
2	2	1	Food-borne Illness
3	3	1	Sanitation
4	4	1	Food Service Equipment
5	3	1	Food Service Utensils
	2	1	FINAL EXAMINATION
	16	5	

- -

EXAMINATION:	Supervised final examination without text books, lessons, or notes; time limit, 2 hours.
MATERIALS:	MCI 33.4j, Food Service Fundamentals. Lesson sheets and answer sheets.
RETURN OF MATERIALS:	Students who successfully complete this course are permitted to keep the course materials. Students disenrolled for inactivity or at the request of their commanding officer will return all course materials.

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FOOD SERVICE FUNDAMENTALS

Lesson 1

Introduction to the Food Service Program

STUDY ASSIGNMENT: Information for MCI Students.
Course Introduction.
MCI 33.4j, Food Service Fundamentals, chap 1.

LESSON OBJECTIVE: Successful completion of this lesson will enable you to identify the mission of the food service program, the organization of the unit dining facility and the responsibilities and duties of the dining facility personnel.

WRITTEN ASSIGNMENT:

A. Multiple Choice: Select the ONE answer which BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

1. The mission of the food service program is to

   a. make the cooks' work easier by having food teams available.
   b. requisition, store, prepare, and serve food.
   c. designate operational control of the system to the commander.
   d. keep the commands from overfeeding and throwing away food.

2. The basic and most important unit in the food service program is the

   a. administrative unit.
   b. enlisted dining facility.
   c. bakery.
   d. storage and accounting office.

3. Who is normally appointed the job of dining facility manager in the enlisted dining facility?

   a. The senior baker
   b. The senior enlisted man
   c. A gunnery sergeant
   d. A staff sergeant

4. Bakers assigned to the dining facility prepare bakery items appearing on the menu under the supervision of the

   a. chief cooks.
   b. chief food service attendant.
   c. cooks on watch.
   d. storeroom man.

5. Marines may NOT be assigned dining facility attendant duty for a period of more than _________ days per year.

   a. 30
   b. 60
   c. 90
   d. 120

6. Who is responsible to the unit dining facility officer for the detailed operation of the facility?

   a. Food service officer
   b. Chief cook
   c. Dining facility manager
   d. Chief food service attendant

7. Who is responsible for supervising and coordinating the activities of the chief cooks?

a. Unit dining facility officer
b. Chief food service attendant
c. Chief baker
d. Dining facility manager

8. Although commanding officers must retain financial responsibility for the dining facility in their commands, they should delegate ________ control to subordinate unit commanders.

a. technical
b. operational
c. administrative
d. general

9. Maintaining the financial status record of the dining facility is the responsibility of the

a. unit CO.
b. unit dining facility officer.
c. dinning facility manager.
d. supply officer.

10. Who is responsible for all property in the dining facility?

a. Supply officer
b. Commanding officer
c. Unit dining facility officer
d. Unit police sergeant

11. Who is responsible for the preparation and accuracy of reports required in the dining facility?

a. Unit dining facility officer
b. Chief dining facility attendant
c. Chief cook
d. Administrative clerk

12. The unit dining facility officer is assigned by the

a. food service officer.
b. installation commander.
c. unit commander.
d. unit executive officer.

13. Who is responsible for estimating the daily needs of the dining facility?

a. Dining facility manager
b. The chief cooks
c. Chief food service attendant
d. Administrative man

14. The purpose of the local menu planning board is to

a. insure that the cooks are kept busy.
b. point out errors in the Armed Forces Menu.
c. plan meals based on the availability of foods, command needs, and costs.
d. insure that the food service personnel are following the Armed Forces Menu.

15. Who plans the command's menu?

a. Chief cook
b. Unit commander
c. Local menu planning board
d. Chief baker

16. Who is responsible for the operational control of the dining facility?

a. Chief cook
b. Unit commander
c. Chief baker
d. Food service officer

17. The food management team is responsible to

a. Headquarters Marine Corps.
b. the unit's commanding officer.
c. the food service officer.
d. the dining facility manager.

18. Who instructs in the proper use of recipe cards?

a. Chief cook
b. Chief food service attendant
c. Food service officer
d. Unit dining facility officer

19. Who checks the Cook's Worksheet for serving times and assists in supervising the serving of the meal?

a. Dining facility manager
b. Chief baker
c. Chief food service attendant
d. Unit dining facility officer

20. Who is responsible for preparing pastry items?

a. Dining facility manager
b. Unit dining facility officer
c. Chief cook
d. Chief baker

21. Who performs the duties of unit authorized custodian?

a. Chief cook
b. Dining facility manager
c. Chief baker
d. Food service officer

22. Who is responsible for publishing the S.O.P. (standing operating procedures) for the food service program?

a. Medical officer
b. Installation commander
c. Unit commander
d. Unit dining facility officer

23. Who assists the menu planning board in preparing a nutritional and well-balanced menu?

a. Activity commander
b. Unit dining facility officer
c. Unit commander
d. Medical officer

24. The financial control of the dining facility is retained by the

a. unit commander.
b. installation commander.
c. unit dining facility officer.
d. food service officer.

25. Who is responsible for dining facility property issued to the dining facility?

a. Supply officer
b. Chief cook
c. Unit dining facility officer
d. Chief baker

Total Points: 25

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FOOD SERVICE FUNDAMENTALS

Lesson 2

Food-borne Illness

STUDY ASSIGNMENT: MCI 33.4j, Food Service Fundamentals, chap 2.

LESSON OBJECTIVE: Successful completion of this lesson will enable you to identify the common causes of food spoilage, the types and most common causes of food-borne illnesses, and the growth characteristics of illness-causing bacteria.

WRITTEN ASSIGNMENT:

A. Multiple Choice: Select the ONE answer which BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

1. The majority of food-borne illnesses can usually be traced to

   a. civilian supermarkets.
   b. yeast.
   c. hot weather.
   d. carelessness.

2. Trichinosis food poisoning is caused by eating insufficiently cooked

   a. lamb.
   b. pork.
   c. beef.
   d. veal.

3. The minute plants found in soil, in water, on dust particles, and in our food are known as

   a. yeasts.
   b. enzymes.
   c. microbes.
   d. protozoa.

4. The average size of bacteria is _________ of an inch in diameter.

   a. 1/250,000
   b. 1/2,500
   c. 1/25,000
   d. 25/1000

5. There are ________ general groups of microbes.

   a. 3
   b. 4
   c. 5
   d. 6

6. Microbes which cause disease or illness in man are known as

   a. pathogenic.
   b. yeasts.
   c. nonpathogenic.
   d. nonpasteurized.

7. The smallest microbes are known as

   a. fungi.
   b. molds.
   c. rickettsiae.
   d. viruses.

8. The largest group of microbes is comprised of

a. molds.
b. bacteria.
c. fungi.
d. viruses.

9. Pork must be cooked to a minimum internal temperature of_____to kill the trichinosis worm.

a. 137° F
b. 120° F
c. 110° F
d. 212° F

10. Food spoilage caused by bacteria can be reduced by

a. early harvesting.
b. careful requisitioning.
c. cleanliness in handling.
d. using dehydrated foods only.

11. Which disease is produced by bacteria that can grow without air?

a. Staphylococci food poisoning
b. Botulism
c. Salmonella food poisoning
d. Streptococci food poisoning

12. The most common food-borne illness is caused by_____bacteria.

a. streptococci
b. botulism-causing
c. staphylococci
d. salmonella

13. The most deadly type of food-borne illness is caused by the toxin given off by the _____bacteria.

a. staphylococci
b. streptococci
c. salmonella
d. botulism-causing

14. Food which is suspected of containing botulism toxins should be

a. refrigerated to lower the temperature prior to cooking.
b. tasted to determine if it is sour.
c. destroyed because it may prove fatal to serve.
d. cooked and then tasted to be sure it is safe to serve.

15. Cans which are swollen or bulged at the end should not be used except those containing

a. tomato paste or tomato sauce.
b. peaches or pineapples.
c. roasted coffee or molasses.
d. green beans or peas.

16. An organism which obtains its food from another living organism is called a(an)

a. mold.
b. yeast.
c. parasite.
d. enzyme.

B. Matching: In the two groups below (items 17-20 and 21-25), match the term in column 1 with its applicable definition in column 2. For each group, select the ONE letter indicating your choice (a or b; or a, b, c, d, or e). After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

Column 1	Column 2
Type of bacteria	Illness caused by bacteria
17. Salmonella	a. Food intoxication
18. Botulism-causing (Clostridium botulinum)	b. Food infection
19. Tuberculosis-causing (tubercle bacilli)	
20. Staphylococci	
Term	Definition or description
21. Cocci	a. Rod-shaped bacteria
22. Solanin	b. Round-shaped bacteria
23. Spirilla	c. Poison found in some sprouting potatoes
24. Bacilli	d. Spiral-shaped bacteria
25. Toxin	e. Poisonous waste product given off by an organism

Total Points: 25

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FOOD SERVICE FUNDAMENTALS

Lesson 3

Sanitation

STUDY ASSIGNMENT: MCI 33.4j, Food Service Fundamentals, chap 3.

LESSON OBJECTIVE: Successful completion of this lesson will enable you to identify the rules of personal hygiene, sanitary work habits, sanitary preparation and food serving techniques including self-service items and sandwich meals, and the proper diswashing procedures.

WRITTEN ASSIGNEMENT:

A. Multiple Choice: Select the ONE answer which BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

1. Who is ultimately responsible for insuring that the food served in the enlisted dining facility is safe and wholesome?

    a. Supply officer
    b. Commanding officer
    c. Medical officer
    d. Unit dining facility officer

2. When are food handlers required to be given a physical examination?

    a. Prior to assignment as a food handler
    b. Within one week after being assigned as a food handler
    c. Only if they have had a communicable disease
    d. Whenever the chief cook feels they are too ill to work

3. Regulations require another physical examination for food service personnel who have been away from their duties for ____days or more.

    a. 15
    b. 20
    c. 25
    d. 30

4. The food sanitation certificate is issued to ____ when they complete their training.

    a. military personnel only
    b. civilian personnel only
    c. both civilian and military personnel
    d. food service attendants only

5. The 2-spoon method of tasting is considered essential in order to

    a. sample food from two areas of the container at the same time.
    b. prevent burning your hands or tongue from hot foods.
    c. prevent contamination of the food by germs from the taster.
    d. produce the correct amount of food for tasting to adjust seasoning.

6. The purpose of wearing a hat or hairnet is to

    a. give a uniform appearance.
    b. keep your hair from becoming messy.
    c. insure that your hair is kept hidden.
    d. prevent hair or dandruff from falling into the food.

7. Smoking in food preparation and dishwashing areas must be

a. kept to a minimum.
b. prohibited.
c. limited to the scullery area.
d. carefully supervised.

8. Since a can opener is a dangerous source of contamination, how often must it be cleaned?

a. Daily
b. Before each use
c. After each use
d. Before storing in its proper compartment

9. Mixing of salads should NOT be done with

a. spatulas.
b. paddles.
c. bare hands.
d. basting spoons.

10. Cooked protein foods which have been held at temperatures between 40° and 140°F for longer than 3 hours must be

a. refrigerated.
b. served immediately.
c. destroyed.
d. cooked thoroughly.

11. Foods to be refrigerated can be placed in pans to a depth of ____ inches.

a. 3
b. 4
c. 5
d. 6

12. Leftover foods should be stored chilled at a temperature that is

a. freezing or below.
b. freezing.
c. above freezing to 40°F.
d. between 40° to 50° F.

13. What is the correct method of thawing frozen foods?

a. In cold water
b. Under refrigeration
c. In a steam cooker
d. In warm water

14. Presoaking of eating utensils is done in water which is kept at a temperature of

a. 110°-120°F.
b. 120°-140°F.
c. 130°-140°F.
d. 140°-150°F.

15. How should you dry machine-washed silverware?

a. With paper towels
b. By air-drying
c. By heating
d. With clean dish towels

Note: Questions 16-20 are only five of the cleaning steps that are followed in cleaning the mechanical dishwasher. You are required to identify the sequence of steps (a-e below).

a. 1st step
b. 2nd step
c. 3rd step
d. 4th step
e. 5th step

16. Wipe the exterior of the dishwashing machine with a dry, clean cloth.

17. Assemble your cleaning equipment.

18. Reassemble the dishwashing machine.

19. Scrub the entire interior of the dishwashing machine.

20. Remove the spray tubes, overflow cap, and scrap trays.

Note: Questions 21-25 require you to identify the appropriate temperature or temperature range.

a. 32°F	d. 120°-125°F
b. 180°F	e. 140°-160°F
c. 212°F	

21. Boiling point of water at sea level

22. Freezing point of water

23. Hand dishwashing

24. Mechanical dishwashing

25. Sanitizing

Total Points: 25

* * *

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FOOD SERVICE FUNDAMENTALS

Lesson 4

Food Service Equipment

STUDY ASSIGNMENT: MCI 33.4j, Food Service Fundamentals, chap 4, section I (para 4-1 to 4-22).

LESSON OBJECTIVE: Upon successful completion of this lesson you will be able to identify the various types of equipment used in the enlisted dining facility, their specific uses, the procedures to follow in cleaning them, and the safety precautions to observe when operating them.

WRITTEN ASSIGNMENT:

A. Multiple Choice: Select the ONE answer which BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

1. The steam-jacketed kettle is used for

a. simmering.
b. frying.
c. broiling.
d. baking.

2. When manually operating the safety valve on the steam-jacketed kettle, you should hold the valve open until

a. water comes out.
b. live steam escapes.
c. no steam escapes.
d. the noise stops.

3. When using the electric food grinder to grind beef, you can adjust the size of the ground beef by changing the

a. speed of the motor.
b. knives.
c. elevation of the feed worm.
d. perforated plate.

4. When inserting food to be chopped into the chopping cylinder of the electric grinder, you should use

a. a wooden knife handle.
b. a section of a wooden dowel.
c. your hand.
d. a wooden stomper.

5. When using the vegetable peeler to peel potatoes, you must sort the potatoes according to their

a. color.
b. texture.
c. size.
d. firmness.

6. When starting the vertical mixer, you should always set the speed selector to ____ speed.

a. second
b. low
c. third
d. high

7. The vertical steamer cooks foods in a short time with a

a. minimum loss of vitamins.
b. large amount of waste.
c. minimum amount of heat.
d. large loss of vitamins.

8. The thickness of the piece of meat being sliced on the electric meat slicer is adjusted by the

a. thickness control dial.
b. speed of the cutting knife.
c. guide rails.
d. emery wheel.

9. If the automatic vegetable cutter and slicer begins to make a knocking noise while it is operating, the ____ on the cutting head has worked loose.

a. hex nut
b. head clamp
c. large bolt
d. wing nut

10. The temperature of the electric range is controlled by setting the

a. pan near the heating elements.
b. shelves in the middle.
c. damper control handle.
d. thermostat control knob.

11. The griddle plate may be cleaned while it is still warm by using

a. steel wool and oil.
b. a squeegee.
c. a griddle stone and used fat.
d. a wiping cloth dipped in oil.

12. Foods to be cooked in a deep fryer should be

a. placed in a solid pan.
b. allowed to cool before frying.
c. dredged in floor.
d. allowed to drain free of excess water before frying.

13. When draining the fat from the deep-fat fryer, you should always

a. drain the fat while it is still at the cooking temperature.
b. discard the fat immediately.
c. cool the fat to 250°F before removing it from the fryer.
d. allow the fat to solidify and then remove it with a spoon.

14. On thermometer-equipped urns, the temperature of the water used to make coffee should be

a. 180°F.
b. 200°F.
c. 210°F.
d. 212°F.

15. The proper way to care for a coffee urn bag is to

a. scrub it thoroughly in a detergent solution and rinse it in cold water.
b. rinse it in hot, clear water and place it in a pan of cold water until it is needed again.
c. allow it to soak in a pan of urn cleaner and rinse it well just before you are going to use it.
d. rinse it in cold water, then allow it to air-dry.

16. The meat tenderizing machine makes tough meat tender by

a. dicing it into cubes.
b. breaking down the meat fibers.
c. removing the fat and gristle.
d. slicing away the tough parts.

17. The degree of fineness of the food being processed in the vegetable cutter is determined by the

a. speed at which the cutter is operated.
b. amount of food being cut.
c. duration of the operating period.
d. type of food being cut.

18. Food on the steam line should be maintained at a serving temperature of

a. 140°-150° F. c. 160°-180° F.
b. 160°-170° F. d. 180°-200° F.

19. The purpose of the steam line is to

a. heat canned vegetables.
b. cook soups, sauces, and gravies.
c. sterilize utensils before meals are served.
d. keep foods hot while they are being served.

20. The refrigerated serving line is used for serving foods which must be

a. kept chilled. c. quickly served.
b. decorated colorfully. d. kept enclosed in glass.

21. Milk is released from the bulk milk dispenser when the _____ is lifted.

a. milk-release knob c. dispensing knob
b. dispensing tube d. well valve

22. The correct item to use for removing bread crumbs from the interior of the pop-up toaster is

a. your fingers. c. a narrow brush.
b. a table knife. d. an air hose.

23. The knife shaft assembly of the vertical cutter/mixer is disassembled on the

a. cooks' worktable.
b. stud on the frame of the cutter/mixer.
c. meat slicer.
d. potato dicer handle in the salad room.

24. If a slice of bread becomes stuck in the rotary toaster, you should

a. remove the slide tray and reach up behind the conveyor to remove it.
b. pull the baskets sideways, releasing the bread.
c. use the handwheel to rotate the conveyor until the slice is released.

25. In the vegetable peeler, the skins are removed from vegetables by the agitation of the revolving _____ throwing them against the abrasive walls.

a. drum c. disk
b. axis d. rim

26. When operating the vegetable peeler you should ALWAYS

a. fill it to its capacity.
b. insure that the abrasive disk is in place.
c. use luke warm water.
d. leave the hinged door open.

27. When turning off the vertical mixer, you should disengage the clutch, place the speed selector in the "off" position, and then

a. remove the mixing attachment.
b. remove the mixing bowl.
c. turn off the motor.
d. lower the mixing bowl.

28. When unloading baskets of food from the vertical steamer, you should always

a. ask for help.
b. use hot pads.
c. leave the steam turned on slightly.
d. open the doors quickly to allow steam to escape.

29. The electric meat slicing machine may be cleaned most effectively by using

a. the pot sink.
b. a stream of water from a hose.
c. a clean cloth and careful wiping motion to remove food particles.
d. a spiral shaped brush.

30. The automatic vegetable cutter and slicer has a (an) _____ that works in conjunction with the hinged top.

a. glass cover
b. adjusting knob
c. automatic stomper
d. safety switch

31. When cleaning the electric or gas operated oven, it should be

a. warmed up to allow for easier cleaning.
b. allowed to cool thoroughly before cleaning.
c. highly polished with emery cloth.
d. cleaned with a griddle stone and given a light coat of salad oil to retard the rust.

32. When using the vertical cutter/mixer, a safety precaution would be to

a. keep your hands out of the revolving bowl.
b. turn on the machine then raise the bowl to a vertical position.
c. lock the bowl in a vertical position before turning on the motor.
d. open the lid only when the machine is running slowly.

33. The entire vegetable slicer attachment can be removed from the food cutter and vegetable slicing machine by

a. using the correct wrench.
b. loosening a thumbscrew.
c. pulling the vegetable slicer up and out.
d. prying it with a cleaver.

34. The refrigerated serving line should be cleaned with a solution of baking soda or

a. water and vinegar.
b. soap and water.
c. salt water.
d. clean water.

35. When using the deep fat fryer you should NOT

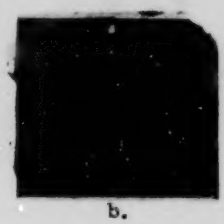
a. heat the fat to the smoking point.
b. use liquid fat.
c. keep the heating coils covered with fat.
d. get help to carry hot fat.

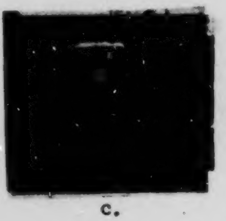
36. When using the electric meat slicing machine you should place the food being sliced on the

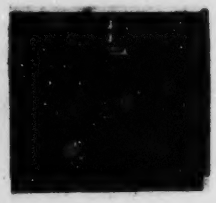
a. feed grip.	c. slicing knife.
b. receiving tray.	d. feed carriage.

Note: Questions 37-40 require you to identify the attachment (shown in a-d below) that is used with the vertical food mixer.

a.


b.


c.


d.

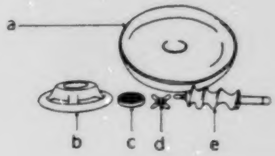
37. Cuts shortening into flour for biscuts, pie crusts, and pastry shells.

38. Mixes and kneads dough of all types for breads, coffee cakes, and rolls.

39. Lightly beats and creams mayonnaise, meringues, and icings.

40. Revolves and rotates in the bowl, producing an action which thoroughly blends and mixes all of the ingredients, beats batters for cakes, creams butter and sugar, and mashes potatoes.

Note: Questions 41-45 require you to identify the various parts of the electric meat grinder shown in a-e below.



41. Perforated plate

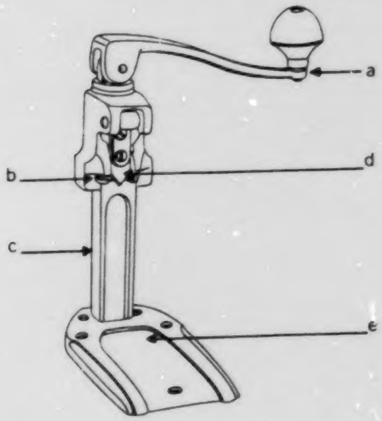
42. Feed pan

43. Worm

44. Cutting knife

45. Adjusting ring

Note: Question 46-50 require you to identify the various parts of the mechanical can opener shown in a-e below.



46. Cutting knife

47. Base

48. Traction wheel

49. Shaft

50. Crank handle

Total Points: 50

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FOOD SERVICE FUNDAMENTALS

Lesson 5

Food Service Utensils

STUDY ASSIGNMENT: MCI 33.4j, Food Service Fundamentals, chap 4, section II (para 4-23 to 4-39).

LESSON OBJECTIVE: Successful completion of this lesson will enable you to identify the various types of utensils used in the Marine Corps dining facility, their uses, and safety precautions in handling them.

WRITTEN ASSIGNMENT:

A. Multiple Choice: Select the ONE answer which BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate box.

Value: 1 point each

1. The device used to weigh individual servings of food is called a/an_____scale.

   a. platform c. even-balance
   b. portion d. mobile

2. The beam of the even-balance scale is graduated into _____ subdivisions.

   a. 1/4-oz c. 1-oz
   b. 1/2-oz d. 1-lb

3. The correct method of measuring _____ is to pack it firmly in the cup and level it off with the edge of a knife.

   a. flour c. shortening
   b. baking powder d. salt

4. To blend dry and liquid ingredients to make a smooth paste, you should use a

   a. metal spoon. c. strainer.
   b. wire whip. d. colander.

5. Colanders and China caps are designed to be used for

   a. measuring foods. c. straining foods.
   b. covering drains. d. serving spaghetti.

6. When you want to lift or turn a roast in the oven, you should use a

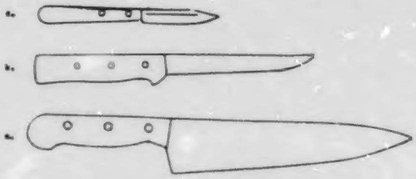
   a. slotted spoon. c. cook's fork.
   b. pair of food tongs. d. spatula.

7. How many scoops of ice cream can you serve from a 1-gallon carton of ice cream if you use a No. 8 ice-cream scoop?

   a. 16 c. 32
   b. 24 d. 48

8. Which knife in the illustration would you use to remove the bones from meat or poultry?

a. Top
b. Bottom
c. Center



9. When using the meat thermometer, you should not insert the bulb of the thermometer into

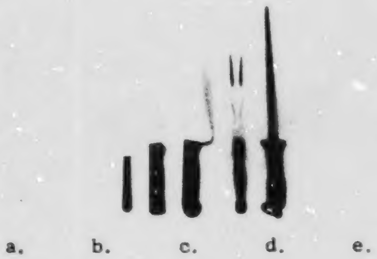
a. small (1-lb) roasts.
b. fat pockets.
c. the thigh of poultry.
d. pork.

10. The operating instructions for each piece of equipment used in the enlisted dining facility are to be

a. kept in the chief cook's desk for easy access.
b. maintained on file in the dining facility.
c. posted for each I. G. inspection.
d. mounted on or near the equipment.

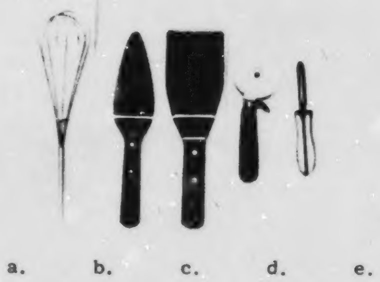
Note: Questions 11-15 require you to identify the name of each type of item shown in a-e below.

11. Butcher steel
12. French (cook's) knife
13. Paring knife
14. Boning knife
15. Cook's fork

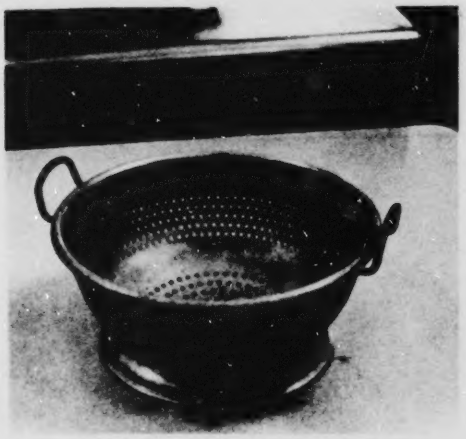


Note: Questions 16-20 require you to identify the name of each food service utensil shown in a-e below.

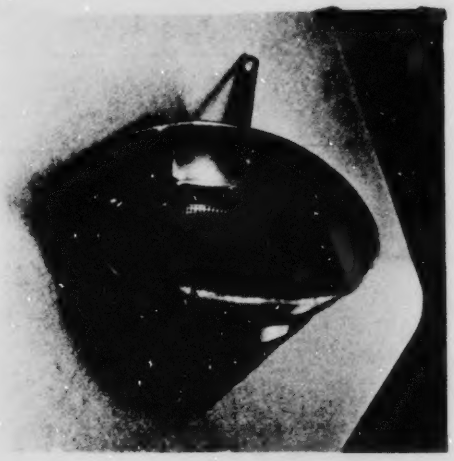
16. Pizza knife
17. Offset spacula
18. Wire whip
19. Pie server
20. Vegetable peeler



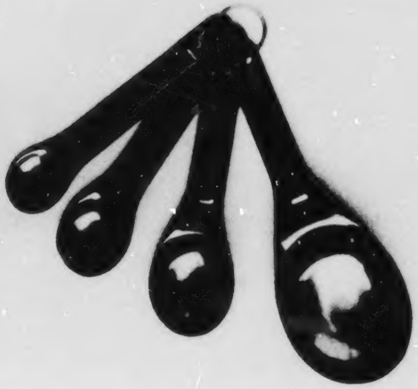
Note: Questions 21-25 require you to identify the name of each item shown in a-e below.



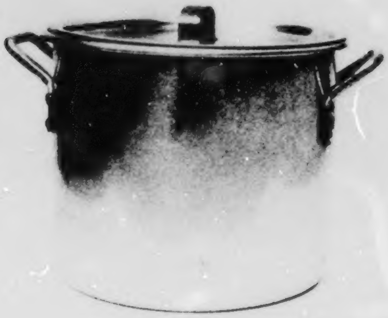
a.



b.



c.



d.

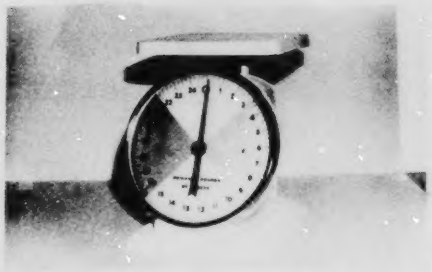
21. Stock pot

22. Colander

23. China cap

24. Measuring set

25. Portion scale



e.

Total Points: 25

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